A REVIEW OF NORTH EAST NSW TIMBER PREDICTIONS AND YIELDS FROM PUBLIC FORESTS OVER THE PAST 20 YEARS

Interim Report

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There is a common pattern to the privatisation of public resources which is evident with the over-allocation of water, fisheries and timber from public land. The resources are allocated to industry for free based on historical allocations at levels that are clearly unsustainable, requiring massive expenditure of public monies to buy back allocations for resources that never existed, while still allowing unsustainable exploitation. After years of payouts and poor implementation all these sectors are still in a mess.

Allocations of timber from public native forests in Wood Supply Agreements in north east NSW has always been plagued by over estimation and allocation of resources. Resource shortfalls have been used as excuses to cut environmental constraints, while requiring payouts of over $13 million of public monies to buy back, or compensate for, commitments of phantom timber.

After years of procrastination the NSW Government has begun to implement its plans for overhauling the management of public native forests. The NSW Government's (2016) Forestry Industry Roadmap shows that the issuing of new Wood Supply Agreements is overdue:

- Work with industry as a matter of priority to examine and resolve North Coast hardwood Wood Supply Agreement concerns – 2017.

- Renegotiate expiring Native Wood Supply Agreements to provide certainty and stability for all stakeholders into the future, while ensuring the supply of timber continues to remain ecologically sustainable – renegotiations commence end of 2016.

The Forestry Corporation recently issued an Expression of Interest for new Wood Supply Agreements for low quality logs, which they intended to issue in June 2018, which would make all timber supplied from public forests in north-east NSW covered by Wood Supply Agreements, and, it would seem, hardwood plantations by two conflicting Wood Supply Agreements.

Once again the Government is using claims of resource shortfalls to justify proposed major reductions in environmental constraints, this time with major increases in logging intensity and an intent to treat native forests like plantations in an effort to increase yields. Any semblance of Ecologically Sustainable Forest Management has been well and truly abandoned.

Since 2014 resource modelling has adopted radically different assumptions to increase the long term 20-100 year modelled yields of high quality logs from an average of 101,250 m³/yr identified in 2010 up to 216,000 m³/yr in 2014. This pre-dates the Boral buyback and there is no explanation as to how this doubling of the volumes of High Quality Logs over 100 years was achieved. It appears to be partially attributed to the application in modelling of the unlawful intensive logging regime "regeneration Single Tree Selection", that the Government intends to legitimise in the new logging
rules, though this doesn't account for the magnitude of the increase. Once again the NSW Government is poised to issue new Wood Supply Agreements based on what appear to be grossly inflated resource assessments.

Hardwood plantations have long been relied upon to offset declining yields of high quality logs from public native forests to meet commitments, providing 14% of high quality sawlogs in recent decades and proposed to provide an average of 22% of high quality sawlogs into the future. Though this seems intended to change with timber from plantations being downgraded to low quality timber and now being offered in new Wood Supply Agreements to overseas buyers for export.

The secretive removal of plantations from timber yields has turned a claimed surplus of High Quality Logs into a deficit and is being fraudulently used to justify major wind-backs in environmental constraints, including logging oldgrowth forest and rainforest protected in the Comprehensive Adequate and Representative (CAR) reserve system.

A succession of NSW Environment Ministers (Parker, Stokes and Speakman), along with the Environment Protection Authority, have repeatedly asserted that the new logging rules (Integrated Forestry Operations Approval) would result in no net change to wood supply, no erosion of environmental values, and no reductions in the CAR reserve system. The Minister's promises have been comprehensively broken.

Complementing the renewal of the Regional Forest Agreements, the NSW Government has made a new Native Forestry Act, has rewritten the logging rules to reduce environmental protections, is proposing to "evergreen" Regional Forest Agreements by extending them indefinitely, and is in the process of making new Wood Supply Agreements. It's all about consigning public forests as a commodity to private sawmill owners indefinitely, irrespective of the increasing environmental costs.

As identified in this review, there are many aspects that are questionable about resource estimates and allocations in north-east NSW that need to be independently investigated.

Note that this review focuses on the supply of High Quality Logs (HQL) from public native forests and hardwood plantations in Wood Supply Agreements (WSAs) granted to private sawmillers (usually for 20 years). Large HQL include large sawlogs, as well as veneer, pile and girder logs. Small HQL include small sawlogs and most poles. This review has been hampered by inconsistent claims of WSA commitments and claimed yields between the Forestry Corporation's different data sets and documents. This does not affect the overall trends though does have some affect the year to year data and comparisons between actual yields and WSA commitments. This report will be updated if the Forestry Corporation provide the single data set requested.

FRAMES refers to the resource modelling used by the Forestry Corporation over this period to predict future yields of HQL 100 years into the future.

Note that over this period the Forestry Corporation was named State Forests of NSW up until November 2005 when it became Forests NSW, before being corporatized and adopting its current name on 1 January 2013. Efforts have been made to try to use the names consistently, though this may not have always been achieved.
NEFA: North East NSW Timber Review

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The currently unlawful practice of "Regeneration Harvesting" in Lorne State Forest (2017) that has been practiced since 2006 and is now proposed to be "codified" and since 2014 has been used to claim dramatic increases in timber volumes.
SUMMARY

This review focuses on timber yields, projections and allocations from public lands, State Forests, in north-east NSW. It primarily considers the allocation of high quality logs (HQL) from public land since comprehensive Wood Supply Agreements (WSAs) were issued in Forest Agreements as an outcome of the Comprehensive Regional Assessments in 1998. These were subsequently incorporated into the State-Commonwealth North East NSW Regional Forest Agreement in 2000. An historical review of the battle to achieve sustainable yields is on the NEFA website.

The 1998 WSAs were the first issued on the basis of the then State Forests of NSW new timber model FRAMES. The intent was to log HQL unsustainably for 20 years before reducing yields down to a sustainable level, with yields to be supplemented in the short term with purchases from private properties and in the longer term with new hardwood plantations. Before the WSAs were issued NEFA warned that FRAMES was over-estimating resources, and this was confirmed within a few years.

In 2003 the FRAMES model was revised and run on the basis of maximising the cut within 20 years, before again dramatically reducing yields. WSAs were reduced, but issued for more that the 20 year estimates of HQL availability, and extended for another 5 years. Once again commitments were not able to be supplied and WSAs had to be bought back to reduce commitments.

For a second time, in 2014 the now Forestry Corporation undertook a major revision of FRAMES, inexplicitly doubling the volume of timber modelled to be available, and with a buyback, in 2015 claiming that current commitments can be sustained indefinitely.

The NSW Government is now poised to issue new WSAs, though there are indications that their intent is to separate plantation HQL timber from native forests and reallocate it as low quality timber for export. By excluding plantations it seems the intent is to reduce WSA for hardwood HQLs, though the Government is using the contrived shortfall to justify winding back environmental constraints and open up oldgrowth and rainforest for logging.

The 1998 WSA & RFA Commitments (Section 2)

In 1998 the NSW Government made the decision, when issuing WSAs for 269,000 m³/yr (cubic metres per annum) of Large High Quality Logs (Large HQL) from north-east NSW public forests and hardwood plantations, to log at 124% of the then estimated sustainable yield for the next 20 years. Large HQL were defined to include logs over 40cm centre diameter, including sawlogs, piles, veneer and girders. The Commonwealth Government signed onto this over-allocation with the signing of the North East NSW Regional Forest Agreement (RFA) in 2000, though with a strategy to supplement yields in the short-term with purchases from private properties and in the long-term with new hardwood plantations.

It soon became apparent that the estimated resources weren't there as by 2002 it was evident that the actual yields were 87 per cent of that predicted. In June 2001 State Forests of NSW forgave a $1 million debt of Ford Timbers in return for a WSA of 15,000 m³/yr of Large HQLs. The Public Accounts Committee questioned the appropriateness of this given that Ford Timbers was never required to pay an up-front fee for the original allocation.
The 2003/4 Yield Review (Section 3).

In 2003/4 State Forests of NSW redid their modelling and identified that by maximising short-term yields for Large HQL the average yield could be 205,000 m³/yr for 20 years, after which were expected to decline to around 64,000 m³/yr for the next 80 years. For Small HQL the 20 year yield was 71,000 m³/yr dropping down to an average of around 39,000 m³/yr thereafter. The caveat was that "the modelled outcome is generally 10-15% above the likely outcome due to factors that cannot be incorporated for practical reasons or cannot be adequately represented mathematically", though this caveat was subsequently ignored in reports and new WSAs.

Two internal reports highly critical of the resource modelling and underlying assumptions at that time appear to have been suppressed, inexplicitly one written specifically for the Auditor General was not mentioned in his 2009 review.

The 2003/4 New WSA Commitments (Section 4).

Somehow based on these outcomes the State Forests of NSW's 2005 ESFM Plan was to provide 223,077 m³/yr of Large HQL and 88,859 m³/yr of Small HQL for 20 years. Thankfully this does not appear to have been achieved, though resources were still grossly over-allocated. The Auditor General identifies the 2003/2004 WSA commitments were issued for 209,500 m³/yr Large HQL, 63,772 m³/yr Small HQ Sawlogs and 28,850 m³/yr of poles and piles. The Government removed the need for a yield review in 2006 and the clause from the WSAs that allowed yields to be adjusted in line with revised resource assessments.

WSAs issued in 2003 and 2004 were for significantly higher volumes than were modelled to be available for the next 20 years. Given the major reductions that were expected to occur after 2023 it is extraordinary that such excessive commitments were made.

The new WSAs for Large HQL represented a reduction of 59,500 m³/yr (22%) of Large HQL. However, while annual commitments of Large HQL were reduced, total volumes committed were increased by 17% as the WSA's were extended for 5 years until 2023. The WSAs were expanded to include some 92,622 m³/yr of Small HQL (Small HQ sawlogs, and poles). Small HQL are defined to include logs 30-40cm centre diameter. The volumes promised in the new WSA were again based on logging unsustainably for the next 20 years before a major reduction was anticipated.

Once again the tradeable allocations (worth over $100 million judging by subsequent buybacks) were given to mill owners for free, though this time a review clause allowing for reductions in response to new yield assessments was removed. Boral were provided with favourable commitments of preferred species and log qualities in their WSA which were not available for other millers.

The committed volumes of large and small HQL were never able to be provided. In a series of court cases Boral took Forests NSW to court for failure to honour WSAs for every year from 2004 til 2010, resulting in a Government payout to Boral of $550,000 for the first 3 years, and undisclosed amounts thereafter.

In 2004 the logging rules were changed to allow the then State Forests of NSW to log buffers of most "unmapped" streams to obtain a large volume of additional timber at a significant environmental cost. In 2006 the then Forests NSW began logging more intensively than the law
allowed in an effort to increase short-term yields while converting extensive areas of native forests into quasi-plantations.

Forests NSW bought two WSA allocations for 12,194 m³/yr in 2006 and 2007 for $2.8 million, though these buy-backs do not appear to have resulted in reductions to claimed timber commitments. These buybacks need to be accounted for.

A review of modelled yields in 2010 showed that yields of HQL would begin to drop after 2020 down to some 127,000 m³/yr, before declining further after 2064 down to around 80,000 m³/yr. This long-term trend of declining yields was consistent with all yield projections up to that time. This reconfirmed a dismal future of hardwood supply from north east NSW, which was reflected in industry pessimism.

Despite the buybacks and yield reductions, and the intentional over-cutting, by 2012 sawmillers were openly expressing concerns about future timber yields, proposing that national parks needed to be opened up for logging to meet expected shortfalls after the expiry of current WSAs. The NSW Forest Products Association asked the 2013 Upper House Inquiry into the management of public land for over a million hectares of national parks to be opened up for logging.

In 2005 Boral bought out Fennings Timbers two mills and their WSA for 23,723 m³/yr of HQL. After quickly closing the mills, in 2012 Boral handed the WSA back to State Forests of NSW, though it remains unclear as to who paid who, and how much. This was deducted from annual WSA commitments.

The 2012/14 Yield Review (Section 5)

In 2012-14 a secretive yield review identified significantly increased yield projections. Astoundingly yields were not predicted to drop until after 2023 to around 198,400 m³/yr of HQL, before again increasing after 2083 to around 252,000 m³/yr. Compared to the 2010 yield predictions, short-term yields were increased by 56%, increasing to 315% later in the period. Overall the total volume of HQL predicted to be able to be produced over a 100 year period almost doubled. How the data was manipulated to achieve such dramatic increases has not been explained and deserves critical review.

Based on this grossly inflated and questionable new modelling the NSW Government determined that they could bring "the supply of timber from the region’s forests back to a sustainable level" by initiating a buyback of 50,000 m³/yr of HQL. In 2014 the NSW Government spent $8.55 million buying back some 50,000 m³/yr of Boral's WSA for HQ sawlogs (including some 40,000 m³/yr of Large HQL). In doing so Boral's WSA was extended for a further 5 years along with their preferential commitment for Blackbutt and log quality, as well as effectively giving them new commitments for 129% more timber than was bought back. Other millers considered that the favourable species and quality commitments given to Boral raised accountability and transparency issues, with even the Department of Primary Industries considering this raises equity and efficiency issues.

Current Yield Projections (Section 6).

Following the Boral buyback the Forestry Corporation's 2015 modelling now predicts yields of HQL steadily increasing from 215,000 m³/yr up to 248,000 m³/yr after 2070. Over the next 100 years native forests are modelled to yield some 185,000 m³/yr of HQL and hardwood plantations an additional 52,000 m³/yr, with the contribution of plantations increasing as HQL from native forests
decrease over time. The different model runs over the next 24 years give variable results, though all show more than enough timber to satisfy current WSAs. However, the reliability of the modelling is questioned.

There are significant concerns amongst customers that HQL committed in WSA are being sold to other millers.

**Current and Future Wood Supply Agreements (Section 7).**

The Forestry Corporation give current allocations of HQL from north east NSW as 220,423 m³/yr (including small poles), with “commitments” of low quality logs comprising an additional 320,000 m³/yr. With deductions for small poles, the modelling indicates a surplus of 37,000 m³/yr (16%) of HQL above the claimed current allocations. This identified surplus represents 54% of the annual allocation of timber bought back from Boral at such a high cost in order to reduce yields to a sustainable level, though given the unreliability of FRAMES modelling this surplus should not be relied upon.

**Claiming Yield Shortfalls to Justify Logging Oldgrowth and Rainforest (Section 8)**

Despite this now rosy picture of future yields, in developing the new logging rules (Integrated Forestry Operations Approval) the NSW Government repeatedly claimed the need to meet timber commitments as reasons to remove remaining protections for most threatened species, reduce retention of Koala feed trees, increase logging intensity (including by legitimising clearfelling), reduce retention requirements for hollow-bearing trees, remove requirements for retaining mature trees, and reduce buffers around headwater streams.

Despite yields from native forests being integrated with yields from hardwood plantations for identifying yields and WSA commitments, for identifying impacts on yields the Natural Resources Commission (NRC) has inexplicably excluded plantations to turn a modelled long term surplus of 37,000 m³/yr of HQL into a deficit of 7,600-8,600 m³/yr. Even then the impacts claimed from the token Koala prescriptions are overstated and the reductions due to Endangered Ecological Communities misrepresented.

What is most outrageous is that the NRC have used their fabricated resource shortfall to justify opening up oldgrowth and rainforest protected as Informal Reserves in the Comprehensive Adequate and Representative Reserve System for logging. To achieve this they have reset the targets for oldgrowth forest and changed the criteria and methodology for mapping both oldgrowth and rainforest to wipe 88% and 62% respectively off the map. Out of the 103,000 hectares of currently mapped and protected oldgrowth on State Forest some 58,600ha could be opened up for logging. Of the 81,567ha of mapped and protected rainforest 50,571 hectares could be opened up for logging.

**Overlogging Since the Buyback (Section 9).**

Since the buyback of 50,000 m³/yr of HQL for $8.55 million the Forestry Corporation has been significantly over-logging Large HQL at well above allocations, over the three years 2014/15 to 2016/17 removing 55,051 m³ of Large HQL in excess of WSA allocations. It cost NSW taxpayers
$1,045,969 to buyback these HQLs in an attempt to reduce yields to sustainable level. It is thus outrageous that these logs are being resold to sawmillers.

At the same time as they are claiming an annual shortfall of 8,600 m³/yr of HQL as justification for logging oldgrowth and rainforest, over just 3 years they have logged enough HQL in excess of commitments to satisfy 6.4 years of the claimed shortfall.

Creating new WSA Commitments (Section 10)

The Forestry Corporation (2018) have already pre-empted the adoption of the new logging regime by issuing an Expression of Interest (EOI) for 416,851 tonnes/yr of low quality sawlogs and residual logs from north east NSW’s native forests and plantations. These were due to be issued in June. The estimates these new commitments are based on cannot be considered reliable.

The EOI shows an apparent intent to reduce the currently claimed commitment of 220,423 m³/yr of HQL down to 185,000 m³/yr, and reallocate all the plantation resource to low quality sawlogs and residual logs and commit them in new WSAs targeted at the export market. Over the next 24 years 13% of HQL are modelled to come from plantations, with the proportion increasing over time, with some 52,000 m³/yr of HQL (22%) modelled to come from plantations over the longer term. The reallocation of the plantation resource to low quality sawlogs and residual logs in new WSA will have significant ramifications on the future availability of HQL and be in direct conflict with the existing WSAs.

This apparent reallocation of plantation timber to low quality timber for export represents a fundamental change in the management intent of plantations and the allocation of resources from public lands in north-east NSW. It may help explain the NRC’s exclusion of plantations. If that is the intent it will require significant industry restructuring which the environment should not be made the scapegoat for.

Though as a fundamental principal $27 million has been spent by NSW taxpayers since 2000 specifically to establish plantations for HQL to take the pressure off native forests in satisfying WSAs, and they should continue to be managed for HQL as intended.

Unaccounted Factors Affecting Timber Yields (Section 11)

It is recognised that climate change will have significant negative impacts on future timber supply, though no adjustments are made to take this into account. Bell Miner Associated Dieback (BMAD) has already resulted in significant declines in timber availability, and this is likely to become worse as climate change progresses, though this impact too is not accounted for (except in one small area). Based on the claimed impacts of Endangered Ecological Communities and the conservative mapping of 17,530 ha of State Forests and plantations affected by BMAD north from Taree, it is apparent that BMAD has already resulted in a reduction in over 10,000 m³/yr of HQL and the impacts are likely many times this. Given that BMAD is a logging related and a management problem, the environment should not bear the cost of any yield reductions. It is grossly irresponsible for the impact of BMAD not to have been taken into account in current and future yield projections.
**Key Issues Requiring Investigation**

**Reliability of FRAMES**

There have been 3 significantly different Forestry Corporation modellings of future HQL availability using FRAMES from north-east NSW's public forests, which were the basis for the WSA commitments in 1998, 2004, and for the new WSAs intended to be issued in the near future. Both the initial 1998 and the 2004 yield predictions were based on unstaible logging and significant drops after 20 years, and both predictions were found to be grossly over-estimated resulting in significant economic and environmental costs. This time the yield predictions are claimed to be based on 100 year sustainable volumes, yet they appear to once again be based on grossly inflated volumes and if relied upon are likely to once again result in significant compensation and environmental costs.

The initial 1998 FRAMES modelling identified 269,000 m³/yr of Large HQLs as able to be supplied for the next 20 years. Within a few years it was evident that this was grossly over-stated and commitments needed to be reduced.

The revised 2003 FRAMES modelling identified an average of 205,000 m³/yr of Large HQLs as able to be supplied for the next 20 years (with a caveat that this was over-stated by 10-15%). The caveats were ignore and the new WSAs were issued for significantly higher volumes than were modelled as available. Two reports, one for the Auditor General, highly critical of the reliability of the modelling were apparently suppressed. Boral were given favourable commitments for species and log sizes that were not available for other millers. The ability to reduce commitments in line with future yield reviews was removed. After a few years actual yields began to steadily decline below commitments. There is much that is questionable about these WSAs.

![Comparison of actual cuts of Large HQL and Small HQ Sawlogs (no poles) compared to WSAs since issuing of new WSAs in 2003/4. Note the significant decline in actual yields below WSA commitments. (Poles are excluded because of confusion about WSA commitments and appropriate allocations of yields to HQLs).](image)

The new 2014 yield assessment assumes a doubling of yields of HQLs after 2023 to 216,000 m³/yr, compared to previous yield assessments averaging 101,250 m³/yr. There is no explanation as to how these increases were obtained, though it seems they are partially attributable to the adoption of the illegal logging regime of "regeneration" STS, but this does not alone account for the magnitude of the increases. These dramatically increased yields were the basis for assessing that the 2014
buyback to reduce yields down to a claimed sustainable level, and will be used as the basis for gifting future WSAs. The veracity of these yield assessments is highly questionable.

![Comparison of 2010 and 2014 Modelling of High Quality Logs](image)

Comparison of 2010 and 2014 modellings of HQL. Note the very dramatic increases in volumes expected by the 2014 modelling compared to Forests NSW's 2010 modelling. The differences are so large compared to all Forestry Corporation's previous modelling that it is hard to give the 2014 claims any credibility.

It has so far cost taxpayers over $13 million in compensation and timber buybacks from private companies that were given commitments for modelled volumes HQL from public forests that never existed. Though the environmental costs are incalculable as environmental laws have been flouted and wound-back in vain attempts to meet unobtainable commitments.

Given the grossly inflated volumes being used to underpin the current modelling, and the gross over-estimations of the past, it is essential that the assumptions underlying the current modelling (and not just the model) are independently and rigorously reviewed. The discrepancies between the 2010 and 2014 modelling need to be critically reviewed.

**Cutting Environmental Constraints to meet Supply**

There have been a multitude of cuts to environmental protections since the inception of the RFA, justified on the need to increase resources to help meet WSA commitments:

Following the over-allocation of modelled available yields in 2003, in 2004 the Environment Protection Licence was amended to exclude most forest operations from its ambit, with the specific intent to allow the Forestry Corporation to log the 10m buffers required by the licence on "unmapped" streams in order to increase resources.

There were numerous amendments to the Threatened Species Licence from 2003 until 2011 that removed or reduced protection for threatened species and exclusion areas.

From 2006 the Forestry Corporation began applying an unlawful version of the silvicultural prescription of Single Tree Selection (STS) involving up to 90% basal area removal, compared to STS’s limit of 40% basal area removal (and retention of all trees under 20cm diameter at breast height (dbh)). In 2016 the EPA on behalf of the Environment Minister stated this intensity "is not consistent with the definition and intent of STS (Single Tree Selection) in the Integrated Forestry
Operations Approval (IFOA). This dramatically increased logging intensity has increase timber yields while greatly increasing environmental impacts, particularly on fauna. This unlawful logging was then adopted as the standard logging intensity for the new logging rules and yield assessments.

Most recently claimed resource constraints were used to propose removing and reducing environmental constraints in the revised Integrated Forestry Operations Approval that are detailed in Section 8 of this report.

After numerous reductions in environmental constraints agreed to by the EPA in their negotiations with the Forestry Corporation, the Natural Resources Commission (NRC) claimed resource impacts to side with the Forestry Corporation to reduce the area of landscape exclusions within logging areas, reduce the numbers and size of trees to be retained for Koalas, increase the sizes of "giant trees" to be retained, increase the sizes of patches allowed to be clearfelled, and reduce the minimum basal area requiring retention under "selective" logging.

The reality is that after all the environmental cutbacks the Forestry Corporation's FRAMES modelling still identifies an average of 237,000 m$^3$/yr of HQL are available from north-east NSW's native forests and hardwood plantations over the next 100 years. This compares to claimed current commitments of 210,025 m$^3$/yr (after accounting for a third of poles not qualifying as HQL in FRAMES modelling) from native forests and hardwood plantations. The question is how could either the EPA or the NRC justify such extensive environmental cutbacks in order to deliver a surplus of some 27,000 m$^3$/yr when a succession of Environment Ministers promised that the new IFOA would result in "no net change to wood supply and no erosion of environmental values"?

Even with this surplus the NRC claim 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 HQL per annum due to protections for Endangered Ecological Communities and Koalas.

The NRC justify turning a surplus into deficit on the basis that they limited their consideration just to the 185,000 m$^3$/yr of HQL modelled to be available from native forests over the next 100 years.

To make up this fabricated shortfall the Government decided to log mapped oldgrowth and rainforest that is currently protected in the reserve system as detailed in Section 8. To all intents and purposes this appears to be fraudulent manipulation of data to create a non-existent shortfall that was used to wind back environmental constraints and is now being used to justify the logging of oldgrowth and rainforest. This data manipulation requires independent review.

Repurchasing and Reselling WSAs

Since the 1998 WSA allocations of 269,000 m$^3$/yr of Large HQ Sawlogs, commitments have been reduced down to some 127,140 m$^3$/yr, a reduction of 53%. There are still outstanding issues regarding the Forestry Corporations 2001 forgiveness of $1 million in debt by one sawmiller in return for their WSA of 15,000 m$^3$/yr of HQL.

Since the issuing of the new WSAs in 2003/4 for 253,922 m$^3$/yr of Large and Small HQ Sawlogs, commitments had been repurchased or retired for 87,817 m$^3$/yr (35%). There were purchases of 12,194 m$^3$/yr for $2.8 million from 2 sawmills in 2006 and 2007 that do not appear to have resulted in reduced commitments.
In 2012 there was retirement of a Boral WSA for 23,723 m³/yr apparently at their request, though there are conflicting accounts as to who paid whom and there is no disclosure of how much was paid.

In 2014 $8.55 million of public monies were spent repurchasing 50,000 m³/yr of large and small HQ Sawlogs per annum for 9 years from Boral to supposedly reduce yields to a sustainable level, at a cost of $19 per m³.

Over the three years 2014/15 to 2016/17 the Forestry Corporation cut 55,051 m³ of Large HQL in excess of WSA allocations. It cost NSW taxpayers $1,045,969 to buyback these Large HQLs and now they are being resupplied to sawmillers. This over-logging needs to be explained, particularly as it cost so much to buy the timber back, the buyback was claimed as necessary to reduce yields to a sustainable level, and because the NRC are claiming a resource shortfall to justify logging protected oldgrowth and rainforest.

Removing Plantations from Wood Supply Agreements?

The Forestry Corporation (2018) was intending to issue new WSAs in June, and may have done so, for all uncommitted Low Quality Sawlogs and residual/pulp logs from north east NSW’s native forests and plantations, totalling 416,851 tonnes/yr. The EOI indicates that the proposed 10 year WSAs are targeted at the export market. The estimates of low quality products are guesstimates rather than modelled yields so there is an even higher risk of over-commitment if the past WSA allocations are a guide.

This is intended to commit all potentially available timber in WSAs, though there is an apparent significant conflict with existing WSAs. The Forestry Corporation’s (2018) EOI shows an apparent intent to reduce the currently claimed WSA commitment of 220,423 m³/yr of HQL down to 185,000 m³/yr, and reallocate all the plantation resource to low quality sawlogs and residual logs and commit them in new WSAs targeted at the export market. Some 22% of the future HQL resource is modelled to come from plantations. The reallocation of the plantation resource to low quality sawlogs and residual logs in new WSA will have significant ramifications on the future availability of HQL to fulfil existing WSAs, and, as already apparent, require increasing logging of high conservation value vegetation, such as oldgrowth and rainforest, to make up shortfalls.

Given the tens of millions of public monies spent to establish hardwood plantations to provide HQL resources ($27 million under the Forest Industry Structural Adjustment Package since 2000 alone), such a change in management intent should be open to public scrutiny.

Not Accounting for Logging Dieback

Bell Miner Associated Dieback (BMAD) has affected tens of thousands of hectares of State Forests and already resulted in significant declines in timber availability, and this is likely to become worse as climate change progresses. Based on the claimed impacts of Endangered Ecological Communities and the conservative mapping of 17,530 ha of State Forests and plantations affected by BMAD north from Taree, it is apparent that BMAD has already resulted in a reduction in over 10,000 m³/yr of HQL and the reduction is likely to be many times this. It is grossly irresponsible for the impact of BMAD not to have been taken into account in current and future yield projections. BMAD is the direct consequence of logging and the resource losses and costs of rehabilitation must be borne by the Forestry Corporation and not the environment.
1. Introduction

After years of procrastination the NSW Government has begun to implement its rewrite of the rules governing management of public native forests. The NSW and Commonwealth Governments are intent on re-issuing the North East NSW Regional Forest Agreement (RFA) without a contemporary reassessment, and then "evergreening" them indefinitely. Underpinning the renewal of the RFA, the NSW Government has made a new Native Forestry Act, has rewritten the logging rules (Integrated Forestry Operations Approval - IFOA) to reduce environmental protections, and is in the process of making new Wood Supply Agreements (WSAs).

The NSW Government repeatedly promised that the new IFOA would result in "no net change to wood supply and no erosion of environmental values". The NSW Government now proposing to log protected oldgrowth forest and rainforest, increase logging intensity, introduce clearfelling, reduce buffers on headwater streams, and remove protections for most threatened species on public land in north-east NSW.

The Government justified all these environmental wind-backs on the grounds that they promised the industry that they would not impact on existing wood supply obligations, yet the apparent intent is to reduce High Quality Log (HQL) commitments and reallocate HQLs from hardwood plantations to low quality logs for export. It is clear that the Government lied to us.

It is hard to fathom exactly what the current WSA commitments from north-east NSW are. Though it is even more perplexing as to what the basis is for the Forestry Corporation's revised yield modelling resulting in the doubling of the HQL resource over the next 100 years, and the veracity of these inflated future yields. Given the predominance of predicted yields in determining environmental protections and future compensation they are the key to understanding the new logging regime.

Based on claims of resource short-falls the Environment Protection Authority (EPA) agreed to major wind-backs of environmental protections, including increasing logging intensity, removing protections for mature trees, reducing buffers on headwater streams, and removing protections for most threatened species.

Then, on the grounds of fabricated resource shortfalls obtained by excluding plantations, the Natural Resources Commission (NRC) intervened to side with the Forestry Corporation against the EPA to further increase logging intensity, increase the size of clearfells, slash retention rates for Koala feed trees, and increase the size of old trees that can be logged.

Even then the NRC 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 m³/yr of HQL due to protections for Endangered Ecological Communities and Koalas. To make up this claimed shortfall the NSW Government decided to log oldgrowth and rainforest protected in the reserve system.

This review focuses on WSAs, yields and resource modelling over the past 20 years in an attempt to understand what is being proposed for north east NSW's public forests.
2. The 1998 WSA & RFA Commitments

After accounting for additions to the reserve system and areas excluded from logging, in 1998 the Forestry Corporation's FRAMES modelling identified 217,221 m³/yr as the sustainable yield of large quota sawlogs. As outcomes of NSW's Upper and Lower North East Forest Agreements in 1998 269,000 m³/yr of High Quality Large (HQL) Sawlogs were guaranteed to sawmill owners for free for 20 years in WSAs. After 2018 this was modelled to reduce down by 32% to 183,500 m³/yr for the next 80 years.

In 2000 the NSW and Commonwealth Governments' signed the Regional Forest Agreement for North East New South Wales (Upper North East and Lower North East Regions) (Anon2000), which states:

Under the Sustainable Wood Supply Strategy, NSW agrees to supply 129,000 m³ per annum for 20 years in the Upper North East Region and 140,000 m³ per annum in the Lower North East Region of High Quality Large Sawlogs and Large Veneer Logs. Annually, approximately 20,000 m³ of High Quality Large Sawlogs and Large Veneer Logs allocated in the Upper North East Region will be sourced from the Lower North East Region over the period of the Agreement.

... It is estimated that the 100 year supply levels after 2018 will average approximately 70,000 m³ per annum in the Upper North East Region and 113,500 m³ per annum in the Lower North East Region of High Quality Large Sawlogs and Large Veneer Logs from existing native forests and Plantations on State forests and other land owned by SFNSW, assuming harvesting under existing terms and conditions.

... Both Governments aim to provide additional sawlog and other wood products that will become available through purchase by SFNSW of private native forest property and through Plantations established on purchased land or as joint ventures. These measures are currently predicted to bring the average annual available High Quality Large Sawlog and Large Veneer Log yield from State forests beyond the 20 years of this Agreement to within approximately 15 per cent of the 20 year contracted levels for Upper North East Region and Lower North East Region.

By the 30 June 2001 Ford Timbers owed Forests NSW $1 million, so Forests NSW retired the debt in return for WSA of 15,000 m³/yr of Large HQL, which was to take effect from 1 January 2003. The Public Accounts Committee (2002) conducted an investigation which found:

The Committee understands that State Forests has never sold a resumed log allocation before and that [Ford Timbers], as with all customers, was never required to pay an upfront fee for the original allocation.

... as [Ford Timbers] never paid for the original allocation, treating the subsequent reduction as a "repurchase" of that allocation is not consistent with commercial practice.

... The Committee was concerned that this action by State Forests was in fact a forgiveness of debt. This is not State Forests' view as they expect to reassign the log allocation and obtain an upfront payment from the purchaser of the allocation as well as continuing royalties.

It appears that the 15,000 m³/yr was never resold, but rather later re-gifted to millers in new WSAs.
It soon became apparent that timber volumes were over-estimated when Forestry NSW’s 2002 North Coast Timber Supply Monitoring Estimate found that “actual yield was 87 per cent of predicted”.

In 2002 Jerry Vanclay (Southern Cross University) undertook a desktop “Review of Projected Timber Yields for the NSW North Coast”, concluding "it is evident that the harvest able to be sustained during the next 20 years is 220,000 m³/year at most ... In the longer term (21-100 years), production from native forests is expected to range between 175 and 110,000 m³/year, and will need to be supplemented from hardwood plantations."

### 2002 North Coast Timber Supply Monitoring Estimates of large high quality sawlogs compared to FRAMES 1998 (From Vanclay 2002)

<table>
<thead>
<tr>
<th>Item &amp; Source</th>
<th>RFA-FRAMES</th>
<th>NCTS Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-term yield (20 yrs)</td>
<td>269,000 m³/yr</td>
<td>220,000 m³/yr</td>
</tr>
<tr>
<td>Medium-term yield (21-40 yrs)</td>
<td>183,500 m³/yr</td>
<td>175,000 m³/yr</td>
</tr>
<tr>
<td>Average Long-term yield (41-100 yrs)</td>
<td>183,500 m³/yr</td>
<td>110,000 m³/yr</td>
</tr>
</tbody>
</table>

In May 2003 the Forests NSW began updating and improving various elements of their wood modelling system FRAMES in response to the identified yield over-estimations. In 2003 the NSW Government created 42,522ha of new national park and reserves (the Icon decision) from Forests NSW’s estate on the north coast, as well as gazetting over 20,000ha of oldgrowth forest as Special Management Zones (SMZ).

Despite the reduction in the area of state forest the “net harvest area”, which is the basis of yield estimates, was actually increased by some 700ha according to Forests NSW’s (2004) FRAMES modelling, primarily because of the decision to remove “buffers on buffers”. In 2004, State Forests ESFM Plans (2005) identify that from 1998-2004 there was a 95,000ha reduction in the area of State Forest (due to delayed implementation of tenure changes identified in the RFA and the creation of some 45,000 ha of additional reserves in 2003), despite this there was a 32,731 ha increase in the loggable area, primarily because of a major reduction in areas protected by prescription (mostly the removal of “buffers on buffers” by allowing trees to be felled into exclusion areas).

### 3. The 2003/4 Yield Review

In September 2004 State Forests released the simplistic report “A Review of Wood Resources on the North Coast of New South Wales”. Unfortunately only bits of data are poorly presented in a confusing and contradictory manner that appears designed to make it hard to interpret.

The outcome of the revised modelling for Large HQL applying a set “high level of cut in the next 20 years” was “220,000 m³ per annum of HQL for the first five years, decreasing to 200,000 m³ per annum for years six to twenty”. The graph indicates that this drops to a “sustainable” yield of something like 64,000 m³/yr after year twenty, though no details of this dramatic reduction in long-term sustainable yield are provided or discussed.

The data is a bit confusing as this modelling relies on logs with small end diameters of 25 and 35 cm, whereas Large HQLs (HQ40) are defined as having a centre diameter greater than 40 cm and Small HQLs (HQ30) are modelled with a centre diameter between 30 cm and 40 cm.
**Modelled Native Forest Quota Sawlog availability** (From State Forests 2004). Note that HQ35 (red) is taken to correspond to Large HQL and HQ25 (blue) to Small HQL. Also that the caveat is “the modelled outcome is generally 10-15% above the likely outcome”.

![Graph showing NF Quota over years](image)

**Modelled Native Forest high quality sawlog availability from 2003** (From Forests NSW 2004).

The State Forests (2004) report states:

*Current sawlog commitments from native forests will require substantial supplementation from plantations and an increased reliance on smaller logs in the medium to long-term.*

*Only 50% of the native forest volume is easily accessible - on slopes less than 20º and more than 50m from an exclusion boundary. Harvesting practices and costs will need to address the issue of difficulty of access in order to meet current native forest commitments.*

Based on the modelled yields the average of Large HQL (NR_NFHQ35) over the 20 years is 205,000 m³/yr. After 2023 yields were expected to decline dramatically, with an identified major reduction in large high quality (LHQ) sawlogs after year 20 to around 64,000 m³/yr. The average of Small HQL (assumed to be NR_NFHQ25) over the first 20 years is around 71,000m³/yr, dropping down to an average of around 39,000 m³/yr thereafter.

Most significantly the report identifies a significant caveat on the modelled yields, stating:

*Interpretation of these results and their translation into management actions requires some care. In particular, the modelled outcome is generally 10-15% above the likely outcome due to factors that cannot be incorporated for practical reasons or cannot be adequately represented mathematically.*

This caveat appears to have been subsequently ignored in all subsequent reports and decisions on resource allocations. If allowance is made for a 15% over-estimation, as a precautionary approach demands, then the 5 year cut of Large HQL is reduced to 187,000 m³/yr and the 6-20 year cut is
NEFA: North East NSW Timber Review

reduced to 170,000 m³/yr. Similarly the 20 year cut of Low HQL is reduced to 60,350 m³/yr. These are significant reductions that should have been applied in the new WSAs.

Timber production in NSW RFA regions, states in relation to Large HQLs:

In 2004, the then Forests NSW undertook a review of wood resources on the North Coast. This review provided a revised sustained yield volume of 222,000 m³ for the first five years and then 200,000 m³ from Year 6 to Year 20.

This is the same estimate relied upon by the Auditor General (2009), who notes:

For the North Coast, where more than two thirds of all sawlog volume is obtained, yield modelling assumes a high level of cut for 20 years in order to meet wood supply commitments agreed by the Government.

This means there will be less timber available in the long term. In order to meet future sawlog commitments there will need to be increased reliance on hardwood plantations and smaller logs.

The Auditor General (2009) compared a 2000 yield estimate with the 2004 yield estimates, noting:

The estimated volumes are generally higher in the 2004 review despite Forests NSW losing 107,000 hectares of estate in 2003 on the north coast. These discrepancies make us question the reliability of yield estimates in the medium-term, especially for hardwood plantations.

What is intriguing about the 2004 yield assessment is that there were two other reports produced at that time that the Government and the EPA are determined to suppress and ignore, despite NEFA frequently referring to them. It is obvious that they were ignored at the time and subsequently because they were damning of the resource assessments underpinning the new Wood Supply Agreements. The two reports are;


The only reference found to the July 2004 report was in Partington and Stevenson (2004), and the Partington and Stevenson report itself was only accidentally found online and does not have a date or identify where it was published. It has since been removed. It is revealing that while the Partington and Stevenson (2004) report is claimed to be a "Report for the NSW Auditor General" the Auditor General (2009) makes no mention of it in his timber review - did he suppress it or was it never provided to him? There is something very wrong that two reports highly critical of the resource assessment relied upon for issuing new Wood Supply Agreements have been suppressed as they are not mentioned in any subsequent reviews of yields.

The July 2004 State Forests report “State of the Resource, A Review of Wood Resources on the North Coast of NSW” is not available on the web and has not apparently been referenced in the various RFA reports or yield reviews, though a subsequent report by Partington and Stevenson (State Forests 2004b) consider that it “clearly described” numerous deficiencies with the “process of estimating merchantable volume”; stating that:
... for some time there has been concern about actual volumes being less than those predicted by the FRAMES process. And recently a report by State Forests highlighted deficiencies in just about every aspect of the process of estimating merchantable volume ...

The deficiencies described include the following: merchantable classification of species that are never harvested; inaccurate estimates from some of the tree volume, taper, and height equations; problems of consistency, reliability and ease of use in relation to tree proportionment, issues in relation to defect modifiers and the division of losses due to inherent defect and those due to sub-optimal log making practices; the limitations of the GIS system in adequately handling the complexity of net harvest area analysis and the difficulty of verifying the results of such analysis; technical problems with the net harvest area modifiers, their lack of currency and the small sample sizes on which the defect modifiers are based; a single strike rate is used but studies suggest different strike rates apply in different areas; growth models and the records on which they are based need to be overhauled; and most importantly the inventory data was no longer considered a reliable description of the resource due to the effect of harvesting and a lack of replacements for the harvested inventory plots.

Partington and Stevenson (State Forests 2004b) undertook a review claimed to be for the NSW Auditor General - ‘Forests NSW: Review of North Coast Standing Volumes for the 2004 Valuation’ which considered “it has been clear for some considerable time that the timber volumes predicted by the FRAMES process are proving difficult to achieve. This naturally creates a question-mark over valuations derived from the FRAMES data.”

Partington and Stevenson (State Forests 2004b) found that the FRAMES data was in disarray for many reasons, including that 500 of the 2000 inventory plots had been logged, noting:

Unfortunately, following the FRAMES process the intensity of effort that went into inventory management diminished. The responsibility for inventory management was allocated to the regions until this was changed in 2003. During this time, about 500 of the original 2000 or so north coast inventory plots were lost to harvesting. Many of these plots were not replaced. We are not critical of this; it may have been an entirely appropriate choice by regional management to invest their resources in other areas that they saw as more important. However, the consequences in Forests NSW own words, was that, “The inventory data can no longer be considered a reliable description of the resource due to the level of harvesting over the last five years and the lack of a replacement programme for harvested plots.”

There were also a number of other issues requiring attention including the need for a new system of management for the area records, the limited data on which estimates of the net harvest area modifier were based, variation in strike rates across the region, a need for new growth and product proportionment models, and various other issues that needed to be addressed. In short a complete overhaul of the native forest and hardwood plantation inventory was required.

... There will be a need for assessment and review and recalibration of some of the modelling. It is also apparent that the rebuilding of the inventory system is a work-in-progress. We think directions that are being taken are generally appropriate and the effort is admirable, but there is still some way to go.
It is also apparent that a number of interim measures have been employed in bridging the gap between the old system and the full implementation of the new system. This has been necessary in order to derive a set of numbers for the current valuation. For example, a single height diameter model was applied, irrespective of species, in order to estimate the height of trees from their diameter. Neither, with the functionality of the current system, was it possible to grow the forest forward from the date of original measurement of inventory plots. …

There are also some technical sampling issues. …

Partington and Stevenson (State Forests 2004) identified that Forests NSW were in the process of rebuilding the inventory system “but there is still some way to go”, noting:  

There was limited time to conduct a detailed statistical analysis of the inventory data and in our judgment little need to do so since it was clear that the prior basis of valuation had to be changed and that the new basis was still a work-in-progress the reliability of which could not be cost effectively determined. Consequently, we concluded that the 2004 valuation could differ substantially from the true value, and, in our judgement, none of the possible statistical analyses were going to change that conclusion.

Partington and Stevenson (State Forests 2004) did identify a variety of problems with the work to date, such as errors in the data, inadequate data on some species, inadequate height models, poor estimates of loggable areas, flawed growth models, poorly specified models for estimating Total Standing Volume, etc., noting:

For example, in the inventory plot data that we received there are 304 trees which are reported as each having a total standing volume (TSV) in excess of 100 cubic metres, and there is one remarkable tree with a TSV of 597 cubic metres! [1.6 cubic metres is considered the average per tree]

In past valuations height was modelled according to species group as a function of site and Dbhob. In the current valuation the height is estimated by a single model for all species as a function of Dbhob. … This use of a single model across all species is a weakness in the valuation modelling and is only acceptable as an interim measure. We anticipate that when a wider range of models are implemented next year that volumes may change significantly as a result.

Another complicating issue is that areas previously considered unmerchantable are now being reclassified as merchantable as the constraints on available timber become more severe.

Partington and Stevenson (State Forests 2004) conclude:

In our opinion the comprehensive improvement of the hardwood inventory is highly desirable, and we believe that good work is being done. However, it is clear that the process is incomplete with many of the new models untested, and some models are still under development. Consequently, while it is feasible to conclude that this year’s estimate of value represents the best estimate currently available, it must also be concluded that there is the potential for the value estimated to differ substantially from the true value.

NEFA have repeatedly asked why these two critical appraisals were suppressed, and whether the Partington and Stevenson (State Forests 2004) report was indeed provided to the Auditor General, though have never been provided with an answer.
4. The 2003/4 New WSA Commitments

Forests NSW’s (2005) ESFM Plan identifies that in 2003 a new ‘Wood Supply Agreement Strategy’ was adopted for 223,077 m$^3$/yr of Large HQL for 20 years until 2023, with 215,422 m$^3$/yr guaranteed and 7,655 m$^3$/yr subject to a variety of caveats. While annual volumes were decreased by 15%, the 5 year extension increased overall volumes of large high quality sawlogs committed by up to 17%. In addition the WSA Strategy included 88,859 m$^3$/yr of Small HQL for 20 years until 2023 with 57,759 m$^3$/yr guaranteed and 31,100 m$^3$/yr subject to a variety of caveats.

Forests NSW’s (2005) ESFM Plan provides the details of Wood Supply Agreements for north east NSW.

<table>
<thead>
<tr>
<th>Product</th>
<th>WSA Volume</th>
<th>WSA Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-quality large Products</td>
<td>215,422</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>7,655</td>
<td>B</td>
</tr>
<tr>
<td>High-quality small Products</td>
<td>57,759</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>31,100</td>
<td>B</td>
</tr>
<tr>
<td>Low Quality Sawlogs</td>
<td>14,897</td>
<td>A&amp;B</td>
</tr>
<tr>
<td></td>
<td>190,000</td>
<td>C</td>
</tr>
<tr>
<td>Total Volume</td>
<td>516,833</td>
<td></td>
</tr>
</tbody>
</table>

Forests NSW (2005) explain:

- The Type A agreements are for a fixed volume for a twenty-year period.
- The Type B agreements provide 75% of the volume fixed for the first 10 years, with future volumes subject to resource assessment review in years 10 and 15 of the agreement. The remaining 25% is a share of production capped at 25% of the total agreement, also subject to review in years 10 and 15.
- The Type C agreements are based on a share of production and if there is insufficient production in any year, the available volume will be distributed equitably amongst customers as a share of the total production in that year. The figure under WSA for Type C is a target volume rather than a fixed commitment.

The Government removed the need for a yield review in 2006 and the clause from the WSAs that allowed yields to be adjusted in line with revised resource assessments.

The Forests NSW (2005) ESFM Plan states:

- The supply of HQL sawlogs will be the most difficult issue over the next twenty years ...
- FRAMES modelling shows that a large proportion of the HQL commitment over the next 20 years will be sourced from areas that are difficult and expensive to access.

The claimed WSA 'Strategy' was uncreditable. It beggars belief that the intent was to issue WSAs for up to 223,077 m$^3$/yr of Large HQL for 20 years when the resource modelling had only identified had only identified an average of 205,000 m$^3$/yr as being available for the first 20 years, and this had been identified as likely to be over-estimated by 10-15%.

It is unclear how the WSA ‘Strategy’ was implemented, as subsequent documents put the WSA commitments as a lot less. The 2009 RFA review (NSW&CoA 2009) identifies the annual commitments for the financial years 2004-2007 as 209,500 m$^3$/yr for ‘High-quality large sawlogs
(incl. veneer and girders) and 63,772 m³/yr for high quality small sawlogs. These commitments are reflected by the Auditor General (2009) who also identifies an additional 28,850 m³/yr of poles and piles, commenting "Around a third of poles and piles supplied meet the specifications of a high quality large sawlog".

<table>
<thead>
<tr>
<th></th>
<th>Large HQL m³/yr</th>
<th>Small HQL m³/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003 Modelled Volume</td>
<td>205,000</td>
<td>71,000</td>
</tr>
<tr>
<td>2003 Modelled Volume minus 15%</td>
<td>174,250</td>
<td>60,350</td>
</tr>
<tr>
<td>FC 2005 ESFM Plan WSAs</td>
<td>223,077</td>
<td>88,859</td>
</tr>
<tr>
<td>RFA Review (2009)</td>
<td>209,500</td>
<td>63,772</td>
</tr>
<tr>
<td>Auditor General (2009) WSA</td>
<td>219,117</td>
<td>73,389</td>
</tr>
</tbody>
</table>

**Comparison of 2003 yield assessment with various claims of WSA commitments.**

1: Adjusted to account for the caveat that "modelled outcome is generally 10-15% above the likely outcome".

2: Adjusted to account for Auditor General's statement that around a third of poles and piles are high quality large sawlogs, and the Forestry Corporation's advice that a third of pole allocations should be deducted for comparison to FRAMES, with the remaining third assumed to be small HQL.

However the data are looked at it is apparent that the WSAs issued in 2003 and 2004 were for significantly higher volumes than were modelled to be available for the next 20 years. Given the major reductions that were expected to occur after 2023 it is extraordinary that such excessive commitments were made.

In order to boost resources in 2004 the Environment Protection Licence was amended to exclude most operations from its ambit, with the specific intent of opening up buffers on "unmapped" drainage lines for logging, contravening the principles of ESFM, but giving the Forestry Corporation access to significant additional resources.

It was clear that the new WSA were grossly unsustainable and it soon became apparent that Forests NSW could not honour the commitments. In 2006 Forests NSW had to pay Boral $550,000 in compensation for 34,000m³ of high quality large sawlog they were unable to supply during 2004-2006. In 2010 Boral Timber commenced legal proceedings against Forests NSW for failure to supply commitments every year since 2006, though the outcome is confidential.

For large high quality sawlogs in 2006 Forests NSW purchased 2,000 m³/yr of a WSA for $500,000. In 2007 Forests NSW purchased a WSA for 10,194 m³/yr for $2,277,000.

Since the WSA's were originally issued in 1998 the then commitments for 269,000 m³/yr of large high quality sawlogs, piles and veneer logs (Large HQL) per annum from north east NSW have almost halved down to 142,757 m³/yr in 2018. Since the 2003/4 new WSA commitments of large HQL have been reduced from 209,500 m³/yr of Large HQL by 32%. Though actual yields have been well below commitments in most years.
Auditor General (2009) found that the commitments for high quality large sawlogs were not being met.

For north-east NSW Appendix K of the RFA review (EPA 2017) states:

*Figure 7 shows that the total HQL and HQS harvested in the North East RFA region was below the RFA commitment level each year of the 2004 to 2014 period.*

*While the North East RFA provides for an annual harvest of 269,000 m³, the North East region WSA commits FCNSW to provide considerably lower volumes. This variance is due to improvements to FRAMES and sustainable yield calculations that were made after the North East RFA was signed.*
In 2009 the Auditor General concluded:  
*We also found that Forests NSW should have sufficient timber to meet its wood supply commitments which are fixed for periods up to 2023 using both native and plantation hardwood.* …

…

*To meet wood supply commitments, the native forest managed by Forests NSW on the north coast is being cut faster than it is growing back. This is especially the case for the blackbutt species. This does not mean that the forest will not regrow but there will be a reduction in yield in the future.*

The Auditor General's (2009) 'Recommendation 4' required that Forests NSW publicly report the results of yield estimates for high quality sawlogs, high quality sawlogs, low quality logs and pulpwood for each region. In response to the Auditor General's request for updated yield assessment, Forests NSW (2010) 'Forests NSW Yield Estimates for Native Forest Regions' undertook revised modelling. This shows *"estimated annual yields by broad product category in cubic metres (m³) over the next 100 years"*. Unfortunately Forests NSW once again failed to provide any detail.

For this assessment the data for the "North East" and "Central" regions were combined to identify the 2010 estimated long-term yields of large and small high quality logs from north east NSW. This shows that yields of HQL would begin to drop after 2020 down to some 127,000 m³/yr, before declining further after 2064 down to around 80,000 m³/yr. This long-term trend of declining yields was consistent with all yield projections up to that time. These show the significance of the yield decline expected to occur in the near future at that time.

This assessment is consistent with the 2003 modelling, taking into account the over-logging that had since occurred.
Comparison between FRAMES yield models for HQL from 2003 and 2010. Note: The 2003 modelling has the caveat "the modelled outcome is generally 10-15% above the likely outcome due to factors that cannot be incorporated for practical reasons or cannot be adequately represented mathematically" (Section 3) - these figures have not been adjusted to account for this.

The modelling shows a dismal future for the future of hardwood supply from north east NSW, which was always an intended outcome of the intentional overcutting for 20 years. Despite the buybacks and yield reductions, and intentional over-cutting, by 2012 sawmillers were openly expressing concerns about future timber yields, proposing that national parks needed to be opened up for logging to meet expected shortfalls after the expiry date of the WSAs in 2023, or sooner.

In his evidence to inquiry into the management of public land in New South Wales Grafton sawmiller, Bruno Notaras, (2012) complained:

I have stopped investing because we are not sure whether we are going to have wood. All indications are that by 2019 it will be pretty tough. I am not sure whether forestry can estimate really how much is out there, because what I have seen is that where we used to work in a 28-year rotation, we are now going back into the same areas in six to 10 years and it is surprising the amount of wood that you are getting out of those areas.

The General Purpose Standing Committee No. 5 (2013) inquiry into the management of public land in New South Wales reported:

6.46 Serious concerns over the sustainability of current logging practices have been raised by inquiry participants from the timber industry with particular concerns over future resources. Greensill Bros Pty Ltd expressed that the view that ‘under the current regulations restricting access, the small area of forests is being overcut’. Newells Creek Sawmilling Company similarly said that ‘we are overcutting the bush because we are limited to a small area for sustainable forestry while vast areas have been locked up for timber production and placed under the management of National Parks’. Mr Notaras highlighted the long term implications for the industry, contending that ‘they will not have high quality large logs in the future’.

13.44 On the North Coast, wood supply agreements that were originally signed in 1998 were reviewed in 2003 following further reservation of native hardwood forests. Mr Douglas Head
described the situation on the North Coast as being unsustainable post 2023, when the current agreements are due to expire. He commented that ‘At the moment, we are in an unsustainable pattern … in the longer term’ and contended that ‘we will not be able to do in 2024 what we are doing now, and nor should we’.

Rather than regulating their use of available sawlogs on a sustainable basis the industry wanted to be given more land to log. In 2012 the Chair of the General Purpose Standing Committee No. 5 asked the Executive Director of the NSW Forest Products Association, how much area of land “would need to be returned and made available for harvesting in order to meet the contractual obligations and the forecast timber delivery in those RFAs?”, to which Mr. Ainley (2012) responded “At a guess, I would suggest that we would need a little more than one million hectares to be returned. However, it depends on which hectares, where they are and how the regulations may affect them”.

The Forestry Corporation (Annual Report 2014-15) also acknowledges it “… may have onerous contracts in relation to wood supply agreements for native forest timber”, for which the present value of the contract is negative.

Even after the Boral buyback these same concerns of overcutting and the unreliability of the Forestry Corporation's over-estimations persist today as shown by the NSW Department of Primary Industries (2017) Primary Processors Survey Report (see Section 5.1). There is further to go, the GHD (2017) NSW Department of Primary Industries report recommending “that a buyback in the order of 15,000 m³ is targeted”.

5. The 2012/14 Yield Review

In May 2012 the NSW Government established a Project 2023 Steering Committee to investigate the issues associated with timber supply on the north coast including sustainability of supply to the end of the term of current wood supply agreements in 2023 and over the long term. This identified major resource shortfalls at the end of the current WSA.

The Steering Committee engaged URS Australia Pty Ltd to conduct a review of timber resources on the north coast though refused to release the URS reports. Instead the NSW Government (2014) would only report on what the Government concluded. The NSW Government (2014) Project 2023 - North Coast Resources Review states:

The key conclusion was that under the current scenario high quality (HQ) sawlog volumes can be maintained in the short term but not into the medium term ...

Updated modelling of the status quo indicates the volume of total HQ logs could be maintained at the level of existing Wood Supply Agreement (WSA) supply commitments, of around 275,000 m³ per year until 2023. Beyond 2023, HQ sawlog volumes are predicted to decline markedly.

...The reduction in supply from native forests occurs primarily in the Blackbutt forest types. ... the current harvest levels for HQ Blackbutt cannot be maintained at a stable yield and ... this is forecast to result in a significant decline in the availability beyond 2023.
Modelling of high quality logs undertaken as part of Project 2023 - North Coast Resources Review.

While the assumptions used to underpin the new modelling are not revealed, the outcomes reveal a major change from previous yield modelling which all display far more significant drops in supply after the end of the current WSAs and declining yields thereafter. This is demonstrated by a comparison between the 2010 modelling (Section 4) and the 2014 remodelling.

Note the very dramatic increases in volumes expected by the 2014 modelling compared to Forests NSW's 2010 modelling. The differences are so large compared to all Forestry Corporation's previous modelling that it is hard to give the 2014 claims any credibility.
The review of modelled yields in 2010 showed that yields of HQL would begin to drop after 2020 down to some 127,000 m\(^3\)/yr, before declining further after 2064 down to around 80,000 m\(^3\)/yr (Section 4). In comparison the 2014 review identifies that yields are not predicted to drop until after 2023 to around 198,400 m\(^3\)/yr of HQL, before again increasing after 2083 to around 252,000 m\(^3\)/yr.

The revised modelling increases the long term 20-100 year modelled yields of HQL from an average of 101,250 m\(^3\)/yr identified in 2010 up to 216,000 m\(^3\)/yr. Over the overlapping 97 year period of 2013 to 2109 the 2010 modelling generates a total volume of 11.3 million m\(^3\) of HQL compared to the 2014 modelling generating a volume of 21.3 million m\(^3\) of HQL, almost double the 2010 total volumes. The differences are astoundingly large, with volumes significantly increased in the short and medium term, and yields more than tripled in the last 20 years. The differences are so large compared to all Forestry Corporation's previous modelling that it is hard to give them any credibility.

Based on their highly questionable modelling the Steering Committee determined:

\[ \text{... that the option of buyback of 50,000 m}^3\text{ per year of HQ logs including 40,000 m}^3\text{ per year of Blackbutt is the most effective way of bringing harvest levels to an even flow, sustainable yield. ... The Government accepted this recommendation of the Steering Committee.} \]

### 5.1. Boral's Deal

In 2003 Boral's new WSA was for 165,000 m\(^3\)/yr of Large HQL (up to 24,350 m\(^3\)/yr of which may be substituted with small sawlogs at a ratio of 1 to 1.25), of which at least 60% must be Blackbutt and 25% over 50cm centre diameter. No other sawmillers obtained such specific and preferential commitments to species volumes and log quality.

In 2005 Boral bought out Fennings Timbers who operated a flooring plant at Gloucester and a sawmill in Walcha. The Walcha mill had older equipment and technology and was identified as requiring some capital expenditure to upgrade operations to Boral standards. The Walcha WSA gave them an additional 18,000 m\(^3\)/yr of Large HQL, raising their stake to 87% of large sawlog allocations, and 5,723 m\(^3\)/yr of Small HQL.

As a result of legal action in 2006 Forests NSW had to pay Boral $550,000 in compensation for 34,000m\(^3\) of Large HQLs they were unable to supply during 2004-2006. In 2010 Boral Timber commenced legal proceedings against Forests NSW for failure to supply commitments every year since 2006, though the outcome is confidential.

In July 2008 Boral announced it would shutdown the Walcha site with 20 job losses, blaming a weak housing market and increasing costs. In August there was a community demonstration outside the mill with the ABC (14/08/2008) reporting "A spokesman for the CFMEU at the site, Bluey Menon says the Government must revoke its log supply agreement with the company and not allow Boral to transfer local logs to other mills". NEFA could not understand why the CFMEU were so intent of giving tradeable WSAs to private sawmill owners during the RFA negotiations without any requirements for either local or value-adding processing.

In 2012 the Forestry Corporation obtained Fenning's WSA from Boral for 23,723 m\(^3\)/yr. Boral apparently wanted to dispose of it because of the poor quality of Tableland eucalypts, and presumably the industry downturn at the time. In keeping with the misinformation surrounding these WSA it is hard to fathom exactly what occurred. The Forestry Corporation (Rahmat Khaiami, 18 March 2015) claim that "Boral paid compensation to terminate the Walcha WSA" while the EPA (2017) RFA Review claims that "a customer sold its Walcha–Styx River allocation in the LNE sub-
region to the State of NSW, thereby reducing the WSA volume by 23,723 m³. So who paid whom is open to question, and the amount paid is unknown. Allocations of HQL were appropriately reduced.

Boral’s 2012 Annual Report identifies that their hardwood division was not performing very well at the time: “Hardwood and Softwood volumes declined 14-15% and Woodchip volumes were 26% lower due to weaker exports”. Boral’s 2013 Annual Report similarly identifies a significant downturn in their timber market, though makes no mention of their retiring the Walcha WSA:

“The Timber business reported a 19% revenue decline and an $11 m reduction in earnings on the prior year, as a result of a number of factors, including:

- significantly lower demand for decorative hardwood products at the premium end of the new housing and alterations and additions markets;
- increased import and domestic competition in softwood and hardwood; and
- a substantial decline in revenue from the woodchip export business as the high Australian dollar reduced price competitiveness

Boral’s 2013 Annual Report notes "In Timber, Boral has been working cooperatively with the Forestry Corporation of NSW to better align short-term log supply with lower demand. Negotiations are continuing to find a sustainable solution that better aligns cyclical demand with available log supply through the term of Boral’s Wood Supply Agreements".

In 2014 the NSW Minister for Primary Industries, Katrina Hodgkinson, announced the decision to pay Boral $8.55 million to buy back 50,000 m³/yr of HQL allocations for the next nine years, reducing their WSA for Large HQL down to some 125,000 m³/yr. Some 40,000 is to be blackbutt, leaving Boral with a minimum of 58,000 m³/yr of blackbutt sawlogs. The Minister for Primary Industries, Katrina Hodgkinson (24 June 2014), claimed:

“This buyback will allow the continued maturing of North Coast forests and has been agreed in negotiations between the Forestry Corporation of NSW and its largest hardwood customer on the North Coast, Boral,” Ms Hodgkinson said.

“Our North Coast forests are certified sustainable, but projections show that without this buyback we would have needed to dramatically reduce the volume of timber supplied to industry after 2023 to ensure the forests continue to be healthy and productive.”

...“This buyback from the biggest player in our native forest timber industry, Boral, secures the long-term viability of the industry as a whole by bringing the supply of timber from the region’s forests back to a sustainable level.

The Boral buyback had limited affect on the actual cut of large and small high quality sawlogs, as logging transitioned from a significant under-cut to a significant over cut. If the actual commitments
are 12,194 m³ per annum less because of the 2006-7 buybacks the undercut is reduced, though the overcut is significantly increased.

Boral's WSA was extended from December 2023 to December 2028, giving them an additional 5 years allocation. This means that the Government paid $8.55 million to buy back a total of 450,000 m³ of sawlogs (9 years), while giving the company an additional 580,000 m³ of sawlogs for free. Boral also had their preferential allocation of Blackbutt and log qualities extended for a further 5 years.

According to Forestry Corporation data after 2013/14 allocations of large high quality sawlogs were reduced by 43,693 m³/yr and of small high quality sawlogs by 11,395 m³/yr. This gives a total reduction of 55,088 m³/yr. This discrepancy is yet to be resolved.

Boral's 2014 Annual Report identifies "Reduced demand in Timber (Hardwood) due to imports, and low levels of alterations and additions, and highend detached housing activity", "Underlying Hardwood volumes remained flat year-on-year, with only structural products achieving a price rise. The hardwood market remains challenging due to increased imports, domestic competitive pressures and subdued demand in the high-end alterations segment.", and "Renegotiated hardwood timber supply from Forestry Corporation of NSW to better align with demand".

There has been significant concern within the industry regarding the favourable conditions of Boral's WSA.

The ABC (1 June 2017) reported that "A mediator has been appointed to avoid a bitter legal dispute over alleged unfair contracts in the regional timber industry", reporting Andrew Hurford as saying "contracts between its competitor, Boral, and the NSW Government-owned Forestry Corporation gave Boral an unfair advantage over other timber processors". The intent appears to have been to obtain generous conditions and 5 year extensions in other WSAs.

The NSW Department of Primary Industries (2017) 'Review of Coastal Hardwood Wood Supply Agreements, Final Report' identifies that there was widespread concern within the timber industry over the preferential treatment of Boral and the secretive nature of the favourable deals done with Boral, for example:

Major issues were raised from stakeholders in relation to the transparency, equity, fairness and efficiency of the allocation of hardwood timber resources on the North Coast. These concerns related predominantly to the differences between the Boral contract and other WSA holders for High Quality sawlog allocations and the impact this is having on supply areas and species mix.

Prior to the release of the details of the 2003 Boral contract through State freedom of information processes in 2012, stakeholders claimed to be unaware of the difference in species provisions between the Boral contract and other High Quality sawlog customers...

A number of customers provided evidence of the subsequent and necessary changes to their indicative species mix, which is having resultant impacts on their business viability. These impacts typically included:

- A decrease in supply of the preferred species, including Blackbutt and Spotted Gum, required to meet contractual obligations to Boral
- An increase in the less desirable species, particular the New England tableland species following the closure of the Walcha sawmill
• Increasing delivery charges as supply is required to be met from harvesting of forests further away from their respective businesses, and
• Lumpy monthly deliveries in terms of both total volume and species mix.

... It is noted that there were customers on the North Coast who indicated that they may not remain viable for the remaining term of their agreements under current supply arrangements.

... Further, many questioned the appropriateness of Boral’s contract management role for the new haulage consortium suggesting that it gives them a potential supply advantage over other customers. It was highlighted that this perception was causing further angst and mistrust amongst the industry when considered in the context of the already differing WSA provisions between Boral and other North Coast High Quality sawlog customers.

... There is a strong feeling of inequity amongst the industry in relation to Boral’s species specific provisions and that the original granting of these provisions lacked both accountability and transparency.

The NSW Department of Primary Industries (2017) concluded:

We found that there are particular issues around equity and efficiency of allocation of high quality sawlogs on the North Coast ...

It is generally accepted commercial practice that businesses may enter into different supply and sales arrangements with different customers, however, this is generally the case when it can be determined that there is a commercial advantage from doing so. During the course of this review, GHD has not been advised of a clearly documented rationale for the allocation of species specific conditions to any one customer in 2003, nor did the original allocation of Type A WSAs rely on a market-based approach to determine best value options against a predetermined set of criteria.

It is obvious that the resource allocations in the current WSAs were not made in an open, transparent, equitable or fair process. No one can understand why Boral was given such a favourable deal in 2003, and NEFA can't understand why increased resources were given away to sawmillers for free at clearly unobtainable and unsustainable volumes, with these extended for 3 years past the expiry of the RFA. There are many things that appear improper about the allocation of public resources to private sawmillers in 2003/4 that should be investigated. The 2014 buyback from Boral prolonged the existing issues of favourable treatment.

6. Current Yield Projections

Following the 2014 Buyback of 50,000 m³/yr of HQL from Boral, in 2015 AS Nicholas & Sons P/L WSA for 1,900 m³/yr was terminated for breach of contract. According to Forestry Corporation data after 2014/15 allocations of large high quality sawlogs were reduced by 1,320 m³/yr and of small high quality sawlogs by 670 m³/yr.

Following the URS Project 2023 assessment, modelling was updated in 2015. The Forestry Corporations (2015) ‘North Coast Resource Assessment Summary 2015’ is the only publicly available data on Forestry Corporations current modelling, and this is vague and simplistic. There no ability to identify how the yields were derived and what the future annual availability is aside from in two graphs. The Forestry Corporation (2015) claim:
The updated modelling confirms that Forestry Corporation can continue to supply timber at the current harvest rate for a 100-year time horizon. Sustainable harvest rates of above 200,000 m³ can be maintained, rising slowly over time, particularly as young Blackbutt plantations increase contribution after 2050.

This is the same data as provided in the NRC (2016) report.

Available timber volume over time differentiated by source (Figure 2 from Forestry Corporation 2015).

It is important to recognise that this modelling is predicated upon adoption of the Forestry Corporation’s intensive logging regime "Regeneration Harvesting" and does not allow for EECs "which have not been comprehensively mapped". In a draft paper by Aaron Walker (October 2015) from the Premier’s Department "IFOA negotiations - evidence base for time and space provisions" it is identified:

**Notes on Wood Supply Forecast**

There are a number of key assumptions in the wood supply forecasts produced by Forestry Corporation.

- FCNSW continue to undertake Regeneration harvesting under the remade IFOA
- Tree retention settings adopted in the remade IFOA do not substantially impact of available timber volumes
- FCNSW retains the right to access to all current available forests
- No allowance for EEC's which have not yet been comprehensively mapped
- Only current High Quality log specifications are modelled
- The species mix supplied will meet industries requirements
- The transition to higher levels of supply from plantations in the longer term will meet customer requirements at that time.

Provided these assumptions hold then FCNSW believes that it can continue to supply at the current commitment levels indefinitely. Importantly; Only Boral hold a contract that requires
the delivery of minimum volumes of key species groups. All other agreements will vary in terms of species proportions based on the 'natural' variation of species that are yielded from the areas harvested in each year, which can be significant at the local scale.

Regeneration harvesting red & green colours show the expected return time to the areas that are cut now (red) and that will be cut over the next 10-15 years (green). This demonstrates a 45 – 60 year rotation length between harvesting cycles – which is consistent with the current harvesting age.

It appears that the 2014 modelling must have been based on the same assumption that the currently unlawful regime of "regeneration harvesting" would be used, as the 2015 modelling basically smooths the yield curve by filling in the gaps using the Boral buyback.

According to the modelling "Regeneration Harvesting" is proposed to provide around 42,000 m³/yr in the early period until 2025, after which it declines to around 10,000 m³/yr until increasing back to around 42,000 m³/yr after 2045. This is presumably based on increasing yields through increased tree removal in the short term and increasing yields from increased regeneration in the medium-long term - basically treating native forests as plantations. "Regeneration Harvesting" does not explain the increase in the long term 20-100 year modelled yields of high quality logs from an average of 101,250 m³/yr identified in 2010 up to 216,000 m³/yr in 2014.

It is not identified what the volume is expected from those areas subject to "Regeneration Harvesting" without this intensive logging, though if it is assumed to double yields from the subject areas it would only represent an average of a 15% increase in annual volumes over the hundred year period compared to the 2010 modelling. On its own the adoption of "Regeneration Harvesting" does not explain the modelled doubling of yields (Section 5).

The Boral buyback represents a total volume of 450,000 m³, which over 100 years equates to 2.1% of the total volumes modelled in 2014. Over the period 2013-2109 the 2014 yield assessment identifies a total yield of 21.3 million m³, with the 2015 yield assessment increasing the yield to 22.9 million m³, an increase of 1.6 million m³ (7.5%). This seems excessive if the Boral buyback is the only change being accounted for.

Estimated species mix over time as generated by the new modelling (Figure 3 in Forestry Corporation 2015).
Comparing the 2015 modelled yields with the 2014 modelled yields does show a smoothing of projected yields, though this is not accounted for solely by the Boral buyback.

While FRAMES modelled yields since the major revision in 2014 show some consistency there are still significant differences between data. The Forestry Corporation of NSW (2016) Hardwood Forests Division Forest Management Plan for the Coastal Forests of NSW provides very different figures, stating: "The figures below reflect the indicative wood volume availability as assessed in March 2015":

Forestry Corporation of NSW (2016) Hardwood Forests Division Forest Management Plan for the Coastal Forests of NSW.
Comparisons of various runs of FRAMES for high quality logs shows that there are significant differences over time and between data sets. The 2010 and 2014 runs predate the 2014 buyback. Though there remains significant variations between the 2015 and 2016 runs, which it is variously claimed to be being relied upon.

I was told by the EPA/NRC (pers. comm. 2018) that the Forestry Corporation's current modelling for HQL over the 2017-2028 (12 year) period is
- 210,600 m³/yr from native forests
- 26,100 m³/yr from plantations.
- TOTAL 236,700 m³/yr.

And over the 2029-2040 period (12 years) it is:
- 193,600 m³/yr from native forests
- 36,500 m³/yr from plantations.
- TOTAL 230,100 m³/yr.

These figures show that over the next 24 years 13% of HQL are modelled to come from plantations, with the proportion increasing over time. It is assumed that in the long term 185,000 m³/yr of HQL is modelled as available from native forests over the next hundred years (see section 8 and 10). The modelled 100 year volumes of high quality sawlogs available from native forests and plantations are 237,000 m³/yr of HQL, which shows that some 52,000 m³/yr of HQL (22%) are modelled to come from plantations in the longer term.

The 2018 estimations are based on new "unpublished modelling". The 2015 and 2016 estimations of future volumes of high quality logs are reputedly based on the same 2015 modelling exercise. All three exercises give significantly different estimates over the 24 year period 2017-2040.

For the period 2017-2028 the 2015 published data identifies a total volume of HQL of around 215,000 m³/yr, yet the EPA/NRC now claim it is 236,700 m³/yr, this is an increase in total volume over the 12 years of 260,400m³, over a year's supply. Conversely for the 2029-2040 period the published data is more comparable, identifying a total volume of HQL of around 233,000 m³/yr, with the EPA/NRC now claiming it is 230,100 m³/yr. No explanation is available for these gross differences.
The table below provides comparisons between all 5 FRAMES estimations identified herein over the period 2017-2040.

<table>
<thead>
<tr>
<th></th>
<th>2017-2028</th>
<th>2029-2040</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average annual volume</td>
<td>Average annual volume</td>
</tr>
<tr>
<td></td>
<td>m³ per annum</td>
<td>% of WSA</td>
</tr>
<tr>
<td>EPA/NRC 2018</td>
<td>236,700</td>
<td>113</td>
</tr>
<tr>
<td>FC 2016</td>
<td>241,167</td>
<td>115</td>
</tr>
<tr>
<td>FC 2015</td>
<td>215,000</td>
<td>102</td>
</tr>
<tr>
<td>FC 2014</td>
<td>240,750</td>
<td>115</td>
</tr>
<tr>
<td>FC 2010</td>
<td>178,250</td>
<td>85</td>
</tr>
<tr>
<td>WSA 2018</td>
<td>210,025*</td>
<td></td>
</tr>
</tbody>
</table>

Comparisons of various yield estimates over the period 2017-2040 before and after the Boral Buyback compared to WSA commitments.

*In provided data the Forestry Corporation note "approx. 1/3rd of pole volume is not HQ category within FRAMES due to size", which equates to 10,428 m³ p.a., which has been deducted from the WSA in this table for making FRAMES comparisons to WSAs.

Comparison of FRAMES differences for runs since the 2014 buyback compared to WSA (adapted to account for poles).

The NRC (Todd Maher 12 Jun 2018) informed me that the modelled yield of High Quality Logs over a hundred year period was an average of 237,000 m³/yr, with an average of 132,000 m³/yr Large HQL and 105,000 m³/yr Small HQL per annum. Over the next 20 years the mix was assessed as being an average 166,000 m³/yr Large HQL and 71,000 m³/yr Small HQL per annum.

It is apparent that FRAMES can be easily manipulated to give whatever results are required for the medium term. Though it is self evident that irrespective of which modelling is used FRAMES does not identify any shortfall in timber commitments and does not provide any justification for the reduction in environmental restrictions now proposed (Section 8).

Aside from the ease of manipulating FRAMES, the Forestry Corporation’s modelling has been proven to be highly unreliable. As well as conservation groups, few sawmillers have any faith in it. For example the NSW Department of Primary Industries (2017) states:
Despite assurances that FCNSW is able to meet its future supply volumes on the North Coast, most customers indicated a lack of confidence and/or awareness of FCNSW resource projections. Customers on both the North and South Coast raised concern that areas of forest are being over cut in some instances to manage supply commitments. Many millers appear to be expecting major problems with declining supply from public lands after the expiry of their current allocations in 2023. One miller commenting "Very concerned - cliff coming needs addressing soon. Too many people chasing logs and in industry".

NSW Department of Primary Industries (2017) states:
A buyback of WSAs could be considered as a precursor to a reallocation of the resource. ... GHD considers that an allocation in the order of 15,000 m³ might be adequate for a buyback to adjust for all these considerations and potentially rationalise the industry or allow a new entrant, however, this would be subject to the development of a full business case. ... GHD recommends that the NSW Government consider a further WSA buyback to reduce the current allocation.

GHD has reviewed the current North Coast supply commitments against delivery volumes by species and concludes that a buyback in the order of 15,000 m³ is targeted.

Similarly the 2018 North Coast NSW Private Native Forest Primary Processors Survey Report found the sawmill owners were still pessimistic about the volumes of timber available. Of the millers surveyed 24% considered log yields from State Forests will decline over the next couple of years, one commenting "FC been over logging for a long time. SF NSW- logs getting smaller & lower quality".

The DPI Primary Processors Survey Report identifies significant concern about short-term yields and uncertainty about long term yields.

While FRAMES does indicate that there are no resource shortfalls, the reality may be significantly different, particularly when the inexplicable doubling in volume estimates between the 2010 and 2014 modelling is considered.

Figure 8 Views of primary processors on future log supplies
7. Current and Future Wood Supply Agreements

Since the issuing of the current WSAs some 87,817 m³/yr of Large and Small HQ Sawlogs have been bought back or retired.

The Forestry Corporation bought two WSA allocations for 12,194 m³/yr in 2006-7 for $2.8 million though these buy-backs do not appear to have resulted in the Forestry Corporation reducing claimed timber commitments. Explanations as to how these volumes have been accounted for in the Forestry Corporation's reported timber commitments are still being sought.

There is a greater reduction when modelled yields are compared to actual yields. The data show that up until 2006/7 yields of Large HQL were met, though since then they have steadily declined. Over the 8 years 2006/7 until 2013/14 the average undercut was 29,120 m³/yr (15.5%). The Boral court cases (see Section 5.1.) show that even for the initial period the species/quality commitments to Boral were not met. Most worrying is that the Forestry Corporation appear to have been cutting HQ Sawlogs above commitments since the buyback, displaying a disregard for it.

Comparison of actual cuts of Large and Small HQ Sawlogs compared to WSAs since issuing of new WSAs in 2003/4.

Through EPA and NRC (2018 pers. comm.) the Forestry Corporation provided the following data for current allocations of High Quality Logs (HQL) from north east NSW:

<table>
<thead>
<tr>
<th>High Quality Product Allocation (m³)</th>
<th>M3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Sawlogs (&gt;40 cm)</td>
<td>127,145</td>
</tr>
<tr>
<td>Small Sawlogs (&lt;40 cm)</td>
<td>46,096</td>
</tr>
<tr>
<td>Poles</td>
<td>31,600</td>
</tr>
<tr>
<td>Veneer</td>
<td>11,202</td>
</tr>
<tr>
<td>Girders</td>
<td>4,150</td>
</tr>
<tr>
<td>Piles</td>
<td>260</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>220,423</strong></td>
</tr>
</tbody>
</table>

In other data the Forestry Corporation note "approx. 1/3rd of pole volume is not HQ category within FRAMES due to size", which equates to 10,533m³, it is thus assumed this should be deducted when making FRAMES comparisons.
In addition to this I was provided with indicative other "committed" timber product volumes (tonnes).

| High Quality Log Volume sold under parcel sales* | ~10,000 |
| Low Quality Logs | ~220,000 |
| Pulp/Firewood | ~100,000 |
| Total | ~330,000 |

Other "committed" volumes (tonnes).

Documents relating to current supply levels of HQL (m³/yr) from native forests and hardwood plantations in north-east NSW often use very different figures: in 2015 in response to a question to Nick Roberts the Forestry Corporation stated that current allocations were 192,471 m³ p.a. (excluding poles), in 2017 the EPA reported that as at 2015 they were 179,600, in 2018 the Forestry Corporation released an Expression of Interest that identified current commitments of all HQL as 185,000 tonnes (likely meant to be m³). Efforts to clarify these and other discrepancies are yet to be resolved.

These concerns aside, the data provided give current commitments of HQL of 220,423 m³/yr, comprised of:
- Large High Quality Logs: 142,757 m³/yr
- Small High Quality Logs (including all poles): 77,696 m³/yr

It is assumed that for comparison to FRAMES the total of HQL should be reduced to 210,025 m³/yr and Small HQL should be reduced to 67,268 m³/yr to account for a third of poles not meeting commitments for small HQLs.

The NRC (Todd Maher 12 Jun 2018) states that FRAMES identifies over a hundred year period there is an average of 237,000 m³/yr of HQL available. This is 36,975 m³/yr of HQL above the claimed current allocations of 210,025 m³/yr (with adjustments to WSAs for poles), with this also representing 54% of the volume of timber bought back from Boral at such a high cost in order to reduce yields to a claimed long-term sustainable level.

The NRC (Todd Maher 12 Jun 2018) informed me that the modelled yield of High Quality Logs over the next 20 years was assessed as being an average 166,000 m³/yr Large HQL and 71,000 m³/yr Small HQL. According to FRAMES there is evidently no shortage of large or Small HQL in the medium term. Over a hundred year period there were 132,000 m³/yr Large HQL and 105,000 m³/yr Small HQL which does indicate that there may need to be a substitution of some Small HQLs for Large HQL well after the expiry of the current WSA’s in 2023.

<table>
<thead>
<tr>
<th>WSAs (m³/yr)</th>
<th>Modelled Wood Supply (m³/yr)</th>
<th>Annual Surplus (m³/yr)</th>
<th>Total 20 y Surplus (m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large HQL</td>
<td>142,757</td>
<td>166,000</td>
<td>23,243</td>
</tr>
<tr>
<td>Small HQL</td>
<td>67,268*</td>
<td>71,000</td>
<td>3,732</td>
</tr>
<tr>
<td>TOTAL HQL</td>
<td>210,025</td>
<td>237,000</td>
<td>26,975</td>
</tr>
</tbody>
</table>

Comparisons of WSA Commitments for HQL with 20 year Modelled Yields (as provided by NRC 2018)

* Reduced to account for a third of poles not meeting definitions for Small HQL in FRAMES.

It is clear that if FRAMES is taken to be reliable that there is more than enough timber to satisfy current allocations of HQL over the next 20 years, and with volumes predicted to be increasing,
there are no shortfalls of HQL expected into the future (albeit there may need to be increased substitution of Small HQL for Large HQL after the expiry of the current WSAs).

It is important to recognise that plantations comprise a large proportion of future yields and that yields are supplemented from private property sources. For north-east NSW Appendix K of the RFA review states:

Over the 2004 to 2014 period, FCNSW has harvested timber from the following sources: native forests within state forests supplied 85% of high quality timber in the North East RFA region, hardwood plantations within state forests supplied 14%, and private native forestry provided the remaining 1%.

Data provided by EPA/NRC (2018) identifies that plantations are expected to provide 11% of the resource from 2017-2028, 16% of the resource over the period 2029-2040 and 22% of the resource over the next hundred years. It is evident that plantations are an important component of future HQL commitments.

NEFA does not accept that the Forestry Corporation providing parcel sales of HQL in addition to allocations is a wise move in light of all the concerns about over-allocations and do not consider them a legitimate "existing wood supply obligation". The industry has expressed considerable concern with the allocation of HQL outside WSA allocations, as identified by the NSW Department of Primary Industries (2017) who commented that "Some customers expressed concern that FCNSW is selling logs that should be used to meet existing supply commitments to customers without WSAs".

The 2018 North Coast NSW Private Native Forest Primary Processors Survey Report reports "Interestingly, respondents reported buying larger volumes of pulp and 'other' grade logs than was sold to them by FCNSW". Accepting that "Survey capture of poles and piles was poor due to processors declining to be interviewed", the data show a variety of discrepancies, which seems to indicate that timber reputedly sold by the FC as salvage grade is being purchased as high quality sawlogs, pulpwood and "other". Given that only 83% of sales are accounted for, this discrepancy is likely to be far more significant.

### Table 6 Surveyed capture of FCNSW hardwood log sales on the north coast

<table>
<thead>
<tr>
<th>Log grade group</th>
<th>Purchases (m³) reported by respondents</th>
<th>Annual volume (m³) sold by FCNSW (av. June 2014-June 2016)</th>
<th>Percentage surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td>HQ FC native (large &amp; small sawlogs, veneer grade and girders)</td>
<td>213,486</td>
<td>201,200</td>
<td>106%</td>
</tr>
<tr>
<td>Poles FC (poles and piles)</td>
<td>5,620</td>
<td>27,403</td>
<td>21%</td>
</tr>
<tr>
<td>Salvage grade FC</td>
<td>126,338</td>
<td>201,204</td>
<td>63%</td>
</tr>
<tr>
<td>Pulp FC</td>
<td>22,708</td>
<td>14,634</td>
<td>155%</td>
</tr>
<tr>
<td>Other (miscellaneous, unknown &amp; firewood) FC</td>
<td>15,028</td>
<td>13,223</td>
<td>114%</td>
</tr>
<tr>
<td>Total</td>
<td>383,181</td>
<td>457,665</td>
<td>83.7%</td>
</tr>
</tbody>
</table>

Table from 2018 North Coast NSW Private Native Forest Primary Processors Survey Report showing discrepancies in reported timber supplies.
The reported discrepancies in timber sales need investigation.

The use of "parcel sales", and other mechanisms, to sell Large HQL above WSA commitments is of major significance when claimed resource shortfalls are being used to justify the wind-back of environmental constraints, including the proposal to open up protected oldgrowth and rainforest for logging.

8. Claiming Yield Shortfalls to Justify Logging Oldgrowth and Rainforest

A key commitment by three NSW Environment Ministers has been that the new logging rules, the Integrated Forestry Operations Approval (IFOA), will result in "no net change to wood supply and no erosion of environmental values". The EPA (2014) state:

*The objectives of the IFOA remake are to reduce the costs associated with implementation and compliance and improve the clarity and enforceability of the IFOAs. The NSW Government is committed to delivering these objectives with no net change to wood supply and no erosion of environmental values.*

The key principles that will guide the remake of the coastal IFOAs and underpin the new IFOA are:

- The IFOA remake will not affect commitments made under the Regional Forest Agreements (RFAs) and NSW Forest Agreements.
- The new IFOA will not change the Comprehensive, Adequate and Representative reserve system.

*The broad landscape-based habitat protection network established by the RFAs and previous licence conditions will be retained. This includes:*

- Existing RFA commitments to the protection of old growth, rainforest, rare non-commercial forest types and the Forest Management Zone (FMZ) layer will be maintained unchanged.

Throughout the deliberations of the EPA and the Forestry Corporation the emphasis has always been on minimising environmental protections to ensure no reduction in timber yields. There were numerous reductions in environmental constraints that were agreed between the agencies in negotiating the new IFOA, such as:

- increase logging intensity across public forests (mostly doubling tree removal), and create a 140,000ha North Coast Intensive Zone to allow Eden-style alternate coupe clearfelling,
- halve the measly 10m wide stream buffers in our vital headwaters while also allowing logging of riparian habitat protected for the past 20 years,
- reduce the retention requirements for ancient hollow-bearing trees, while removing the requirements to protect the next largest trees as recruitment trees to replace the hollow-bearing trees as they die out,
- remove the requirement to protect a sample (i.e. variously 3-5 per hectare) of mature high nectar-producing trees so essential to provide the abundant nectar needed by a plethora of species.
removal of the need to survey for most threatened species, the removal of most species specific prescriptions and the opening up of most exclusions for threatened species established over the past 20 years.

- remove requirements to thoroughly search for Koalas ahead of logging and protect Koala High Use Areas, while zoning 43% of the highest quality habitat for extensive clearfelling.
- allow logging dieback to run rampant through our forests.

There were a variety of issues that the agencies were not able to agree on (NRC 2016), for which the Natural Resources Commission (NRC) mostly sided with the Forestry Corporation against the EPA on the basis of resource shortfalls, including:

- reductions in the minimum area of landscape exclusions within logging areas
- reductions in the minimum numbers and size of trees to be retained for Koalas
- reductions in the minimum sizes of "giant trees" to be retained
- increases in the size of patches allowed for clearfelling
- reductions in minimum basal area retention under "selective" logging

Even then the NRC (2016) claim 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 m³/yr of HQL due to protections for Endangered Ecological Communities and Koalas. To make up this claimed shortfall the Government decided to log oldgrowth and rainforest protected in the reserve system.

Nowhere in their documents do the NRC say what timber volumes they base these conclusions on. In response to enquiries they initially stated that their considerations have been based on FRAMES modelling that an average of 237,000m³/yr of HQL are available from north-east NSW's native forests and hardwood plantations over the next 100 years. They later changed this to state that their "assessment was based on ~180,000 m³/pa harvest volume (avg over 100 years) supplied from the native forest estate only".

This is clarified by NRC in further correspondence:

The 180,000 figure represents an average contribution from Native Forests for the full 100 year modelled wood supply timeframe. It was only used to represent wood supply over the full 100 year period for the wood supply impact analysis and should not be extrapolated to represent any other specific period.

Though in response to further questions the NRC claimed that:

180,000m³/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).

It seems strange that NRC would use 180,000 m³/yr as their baseline for assessing impacts on Endangered Ecological Communities (a subset of Threatened Ecological Communities) if TECs have already been accounted for as this would be double-counting. So, except for limiting it to native forests, it remains somewhat confusing as to what the NRC's baseline is. It is assumed that the correct baseline is 185,000 m³/yr.

So it appears that the claimed 7,600 to 8,600 m³/yr shortfall of HQL is the decline per annum averaged over 100 years, when compared to the level of modelled yields from native forests.
assessed by the Forestry Corporation to be available on average over a hundred year period. The NRC explanation is:

The assessment of wood supply impact relates to changes in net harvestable area arising through TEC exclusions and changes in yield from harvest areas through new settings for koala protections. The estimated wood supply availability recognises the existing standing stock and the growth that arises from the potential harvestable area, and seeks to take both into account.

... The impact of TEC exclusions and enhanced koala protections is an estimated reduction of 7,600-8,600m$^3$/yr of HQ log (Table 11 in NRC’s 2016 report) compared to modelling of the same timeframe and basis applying the previous settings, and reduced availability of commercial tree species within harvest areas.

In order to help justify their preference for logging oldgrowth and rainforest the NRC had to massage the figures further by excluding plantation timber, in the full knowledge that "the proportion of high quality timber available from plantations increases over time" while the proportion from native forests is decreasing. By excluding plantations the NRC concocted a false decline in future sawlogs.

Using both native forests and plantation hardwoods the agencies now claim that 237,000 m$^3$/yr of HQL are available from native forests and plantations for the next 100 years. This represents an excess of some 27,000 m$^3$/yr above current commitments of around 210,025 m$^3$/yr (with the reduction for small poles needed for comparison to FRAMES). It is similarly evident from the detailed figures provided by EPA/NRC (pers. comm. 2018) for the next 24 years that there is no resource shortfall to address in the short term. The Forestry Corporation modelling for HQL over the 2017-2028 (12 year) period is:

- 210,600 m$^3$/yr from native forests
- 26,100 m$^3$/yr from plantations.
- TOTAL 236,700 m$^3$/yr.

And over the 2029-2040 period (12 years) it is:

- 193,600 m$^3$/yr from native forests
- 36,500 m$^3$/yr from plantations.
- TOTAL 230,100 m$^3$/yr.

Plantations are expected to provide 11% of the HQL resource from 2017-2028, 16% of the resource over the period 2029-2040 and 22% of the resource over the next 100 years. As identified by the EPA (2017) in the longer term:

... once mature, the plantations can produce 75,000 m$^3$p.a. of high quality log products over a 50-year period to augment native forest log yields. This represents about one third of the total sustained yield and significantly supplements the native forest resource for the North East RFA region.

This is expected to fully kick in after 2050.

Given that NRC are claiming there will only be a shortfall of up to 8,600 m$^3$/yr compared to modelled availability, it is clear that according to the NRC and Forestry Corporation’s figures that there is no need what-so-ever to log oldgrowth forest or rainforest to meet commitments. In fact, according to
the data, with hardwood plantations included, there is a significant surplus of HQL that allows the restoration of many of the cuts to environmental protections made so far.

Outrageously the NRC based their assessment, and claims of resource shortfalls, purely upon a volume of 180,000 m³ from native forests which is 57,000 m³ less than total modelled HQL availability. It is strange that the NRC show no concern with using a figure that is already 30,025 m³ less than claimed commitments of HQL (with the reduction for small poles needed for comparison to FRAMES). By excluding plantations from their figures NRC have misrepresented a surplus of timber as a shortfall.

Given NRC's (2016) exclusion of plantations it is perplexing that that they state:

*Based on this indicative analysis, the Commission suggests Government will need to consider buying back high quality sawlog quota to reduce the current pressures on wood supply, particularly until increased wood supply from plantation sources becomes available.*

This is even stranger given the EPA (2017) comment that:

*In 2012, through Project 2023213, the NSW Government modelled the entire North East RFA wood resources (i.e. including both plantation and state forests) as one integrated source, as part of achieving the broader objective for the North Coast to transition to a long-term sustainable wood supply strategy. FCNSW has adopted this approach to modelling the entire plantation and native forest estates in the North East RFA region as one integrated resource.*

... This approach allows for maximising the value of the plantation estate and delivering the greatest supplementation effect to the native forest resource in line with a long-term sustained yield objective.

The NRC also fail to account for the Private Property Timber Supplementation Program which over the period 2003 to June 2014 delivered an average of 3,600 m³/yr through agreements with private property owners to harvest wood under PNF PVPs (EPA 2017).

It is outrageous that the NRC are excluding plantations from their projections to justify logging oldgrowth forest, rainforest, koala feed trees, and larger trees, as well as increasing logging intensity. It is equally evident that the claimed shortfalls for Koalas and Endangered Ecological Communities are not justified by the evidence. The NRC's pretence of the need to slash environmental protections to satisfy misrepresented logging commitments is fraudulent.

### 8.1. Koala Impact

The NRC (2018 pers. comm.) elaborate:

*The koala settings impact was estimated based on harvest area inventory assessments and likely proportions of browse tree retention according to koala browsing species preference research. The estimated impact was between 3,000-4,000m³/yr.*

The assumption that the retention of minimal numbers of Koala feed trees will have any significant impact on timber supplies compared to current prescriptions needs to be seriously questioned. For the IFOA the NSW Government has identified high and medium quality Koala habitat on State Forests for the purpose of applying prescriptions. Within a 15 hectare area encompassing high quality Koala habitat 10 feed trees >20cm diameter at breast height (dbh) per hectare of high quality...
habitat need to be retained. Within medium quality habitat 5 feed trees >20cm dbh per hectare need to be retained.

Within many areas of modelled habitat there will not be the required numbers of feed trees >20 cm dbh left to be retained due to past heavy logging and the targeted removal of preferred Koala feed tree species, for example, 23% of high quality habitat and 18% of medium quality Koala habitat in the Lower North East Region was subject to unlawful intensive logging from 2006-2017, with the aim of converting such forests to quasi-plantations of blackbutt.

<table>
<thead>
<tr>
<th></th>
<th>High Quality Koala Habitat</th>
<th>Medium Quality Koala Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Area on SF</td>
<td>36,152ha</td>
<td>212,073</td>
</tr>
<tr>
<td>Subject to Heavy, medium and regen. STS</td>
<td>8,147ha (23%)</td>
<td>38,547 (18%)</td>
</tr>
</tbody>
</table>

IFOA Identified Koala habitat qualities to be subject to prescriptions, and the areas of habitat subject to unlawful intensive logging in the LNE up until early 2017.

Outside the North Coast Intensive Zone the current proposal is to increase logging intensity in the rest of the forests, where the minimal basal area required to be retained is 10m² ha in the "regrowth" zone and 12m² ha in the non-regrowth zone.

A 20cm diameter tree has a basal area of 0.0314 m², thus under the proposed rules in the regrowth zone 318 trees 20 cm dbh per hectare would require retention to make up a basal area of 10m². A 40cm diameter tree has a basal area 0.1256 m², thus under the proposed rules in the regrowth zone 80 trees 40 cm dbh per hectare would require retention.

The current Koala prescriptions require the identification and exclusion from logging of Koala High Use Areas, and the retention of 5 Koala feed trees per hectare in "intermediate use" habitat. The NRC (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.

It also needs to be recognised that current tree retention requirements for up to 5 mature/late mature recruitment trees and 3-5 mature nectar feed trees per hectare are being removed. These are trees that often qualify as large HQ sawlogs which have a far greater impact on timber supply than 5 small trees. Current legal requirements are also that 60% of basal area, and all trees under 20cm dbh be retained under the most common silvicultural prescription of Single Tree Selection..

The North Coast Intensive Zone is intended to have no minimum basal area retention, though as identified above much of it has already been subject to conversion to quasi plantations and there are currently significant tree retention requirements that apply,

It is thus ludicrous to claim that the retention of 5-10 trees >20cm dbh per hectare will have any significant impact on resources in the regrowth or non-regrowth zones. The NRC's claim that the retention of Koala feed trees in limited areas will reduce timber volumes by 3,000-4,000m³/yr (i.e. up to 2% of total volumes) for the next 100 years compared to the status quo is not justifiable.
8.2. Endangered Ecological Community Impact

Regarding assessed Endangered Ecological Community impacts the NRC (2018 pers. comm.) elaborate:

The TEC exclusions were estimated cause a reduction of over 11,000 hectares of net harvestable area. Analysis of these areas using inventory and forest type mapping data determined that the current available high quality timber on these new exclusion zones was 232,000m³. This area contained significant volume of high demand species such as spotted gum (56,000m³).

In respect to growth and yield modelling, 180,000m³/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). Over 100 years the impact of removing the area from the model is escalated, as previously modelled future wood supply from regrowth after harvesting the new TEC exclusions is also unavailable.

A comparative analysis of FRAMES had the objective function of seeking to meet existing wood supply agreements and then achieve an overall non-declining yield. This results in annual reductions of an annual availability of an estimated 4,600m³/yr of HQ log supply across the north coast over the 100 year planning timeframe compared to an identical model with the TEC mapped areas available.

In 2014 the NSW Environment Protection Authority (EPA) and the Forestry Corporation of NSW commenced a project to map EECs “to support improved recognition, regulation and management of Threatened Ecological Communities (TECs) in NSW native forestry”. The project was completed in June 2016. It is the output from that project that is now being used to claim increased impacts.

What the NRC don’t say in their explanation is that they included 11,000 hectares of forest in the Forestry Corporation’s Urbenville Management Area, of which only 2,466ha is EECs outside existing Forest Management Zone exclusions (FMZ 1, 2 and 3).


A substantial portion of Urbenville Management Area in Supply Zone 1 is excluded from harvesting through this analysis. Five of the state forests in this area were considered impractical to manage for commercial purposes given reductions in net harvest area and areas affected by Bell Miner Associated Dieback.

The NRC identifies the area as comprising of Donaldson, Mount Lindsay, Unumgar, Bald Knob and Woodenbong State Forests, which have an area of 11,006 ha. Of this area 3,212 ha is existing FMZ exclusions, leaving a net area of 7,795ha, of which mapped EECs (Grey Box-Grey Gum Wet Sclerophyll Forest, White Gum Moist Forest and Lowland Rainforest) comprise 2,466 hectares. This leaves 5,329 ha of the net logging area that was excluded because of Bell Miner Associated Dieback (BMAD) (see Section 11.1).

The most recent mapping of BMAD (DPI 2018) identifies 3060 hectares as occurring in this area, with 2,635 ha outside FMZs, comprised of 584 ha within EECs and 2,051ha outside EECs. It is
considered that this mapping understates the true extent of BMAD by over half (Pugh 2018, Section 11.1), meaning that most of the rest of the forest is likely affected.

<table>
<thead>
<tr>
<th>Area (ha)</th>
<th>Area outside FMZ Exclusions</th>
<th>Area outside FMZ Exclusions and EECs</th>
</tr>
</thead>
<tbody>
<tr>
<td>FMZ Exclusions</td>
<td>Total ha</td>
<td>EECs</td>
</tr>
<tr>
<td>Abandoned State Forests</td>
<td>11006</td>
<td>3212</td>
</tr>
</tbody>
</table>

**Forests identified as excluded from resource assessments by NRC.** Note that the extent of BMAD is considered to be understated.

This map depicts the abandoned State Forests, showing Protected Forest Management Zones, Endangered Ecological Communities outside FMZs, and BMAD mapped in 2018 outside both. Note that BMAD is far more extensive than shown.

This means that around half of the 11,000 ha excluded by NRC on the basis of EECs was actually excluded because of BMAD. BMAD is a widespread problem and extensive areas need to be excluded from resource assessments to account for it, though it was plainly wrong for the NRC to attribute this to EECs. This raises the much bigger issue of the need to exclude much larger areas of forests affected by BMAD from FRAMES modelling (Section 11.1).

This is quite aside from the fact that most EECs have been required to be excluded from logging and thus resource allocations for years. Comparisons between the recent (EPA 2016) mapping and mapping used in Forestry Corporation Harvesting Plans actually show that the EPA have generally reduced the total extent of mapped EECs shown in harvesting plans in many areas (i.e. Giberagee cmpts 117 and 118, and Bungawalbin cmpts 46-48).
8.3. Oldgrowth and Rainforest Logging

The NRC (2018) are using their fabricated claims of resource shortfalls to justify opening up oldgrowth and rainforest protected as Informal Reserves as part of the Comprehensive Adequate and Representative Reserve System for logging. To do this they are using revised targets, restricting criteria and using inappropriate methodologies to wipe extensive areas of both off the map.

The community fought hard in the late 1970s and early 1980s to protect rainforest and in the late 1980s and 1990s to protect oldgrowth forests. These were mapped in the Comprehensive Regional Assessment under the supervision of all agencies and key stakeholders in an open and transparent process involving an Old Growth Expert Panel in 1998.

Those oldgrowth forests on State Forests, above high thresholds for a combination of ecosystem, fauna, flora and Centres of Endemism reserve targets (called 'summed irreplaceability'), were identified as High Conservation Value (HCV) Oldgrowth and included in informal Reserves as part of the Comprehensive Adequate and Representative reserve system in 2000. They were counted as contributing to reserve targets for oldgrowth, forest ecosystems, and national estate in the 2000 Regional Forest Agreement.

Mapped HCV oldgrowth forests in the Upper North East are also legally protected as a heritage item under the NSW Heritage Act 1977. An additional 20,000 ha of oldgrowth was included in Special Management Zones in 2003.

There are currently 103,000 ha of mapped oldgrowth on State forests protected in the Informal Reserve system and Special Management Zones (under the Forestry Act) in north east NSW.

The NRC have comprehensively done over oldgrowth forest. They changed the methodology for setting targets by combining the upper and lower north east regions rather than having regional targets. Then they identified additional areas as contributing to reserve targets including "Crown reserves with a clear biodiversity protection intent" and "conservation agreements or regional property agreements on private land". NRC fail to identify their extent and the levels of meaningful protection their additions provide to oldgrowth forest in contravention of the JANIS (1997) intent that other tenures should only be considered where "it is not possible or practicable to include conservation values into Dedicated Reserves", and the requirement that "that appropriate management intent should be demonstrated before the area concerned could be considered to be part of the CAR reserve system". Through this process the NRC increased the area of oldgrowth claimed to have met targets by 42%, making 66,606 ha of oldgrowth potentially available for logging.

The NRC are effectively attempting to swap oldgrowth forest protected in Informal Reserves on public land for oldgrowth provided with nebulous protection on other Crown lands and on private land. These other tenures provide lesser level of protection than those oldgrowth forests currently in informal reserves on State Forests.

Then the NRC set a threshold for remapping based on oldgrowth stands being "comprised at least 50 percent old growth forest ecosystems (by area in the compartment) that exceeded the 60 percent JANIS reservation target". This means that up to 49% of the remapped stands may be inadequately reserved oldgrowth. Though in practice it is far worse, of their 13 trial areas they identify 2 of their remapped stands being dominated by inadequately reserved oldgrowth, a review
of the sites undertaken for NEFA's submission identified an additional 3 sites as having no oldgrowth that met their revised targets and 2 with the majority of oldgrowth not meeting targets.

Then the NRC changed the criteria for mapping oldgrowth (i.e. by excluding oldgrowth tree types that do not typically have dead branches visible in their crowns, such as Brushbox) and the methodology by applying decision rules developed for 1:25,000 photographs to much higher resolution images (i.e. where more understorey trees are visible) without adapting the criteria to the new mapping. The outcome of this remapping is that 88% of currently mapped oldgrowth is wiped from the map.

The NRC report that for yield assessments the Forestry Corporation assume that after allowing for stream and other exclusions "up to 70 percent of currently mapped old growth" will be available for logging.

The outcome from these multiple revisions is that of the 103,000 ha of protected oldgrowth on State forests, in the order of 58,600ha (57%) may be wiped from the map and made available for logging using the NRC's criteria and methodology, with some narrow strips and patches retained within these areas.

There are currently 81,567ha of mapped rainforest protected within the north-east NSW Informal Reserve system. These have a 100% reserve target, though the criteria have again been altered to "exclude areas with emergent non-rainforest species [including Brush Box] that exceed 30 percent of the upper crown cover". The NRC trial resulted in 62% of mapped rainforest being mapped out of existence. Based on this 50,571 hectares of mapped rainforest could be opened up for logging.

In opening up oldgrowth and rainforest for logging, the NRC (2018 pers. comm.) do emphasise that: The NRC’s 2016 report notes that further analysis and modelling with FRAMES is required to more accurately estimate the potential wood supply impacts. In addition, the NRC’s 2018 recommendations proposed that any shortfall in wood supply will need to be verified before any rezoning as a means to address wood supply shortfalls and meet the Government’s twin commitments.

All that the NRC are doing is opening the door as wide as possible to allow future logging of unspecified volumes of timber from currently mapped and protected oldgrowth and rainforest. While the NRC (2018) are claiming that an average of up to 8,600 m$^3$/yr of HQL averaged over100 years are required, future yield reviews could significantly increase this.

This gives a current requirement for 860,000 m$^3$ of HQL to make up the NRC's fabricated shortfall over the next 100 years. For the NRC's trial areas the average yields anticipated were some 30m$^3$ per hectare of HQL for "commercial" oldgrowth , 8m$^3$ per hectare for "low commercial" oldgrowth and 19m$^3$ per hectare for rainforest. The Forestry Corporation mapping identifies some 29,500 ha of "commercial" oldgrowth above targets, if all this is logged it would theoretically yield some 884,000 m$^3$. Allowing for logging exclusions then it is apparent that as well as all commercial oldgrowth, significant areas rainforest are likely to be targeted.

With revised yield reviews and revised decision rules the extent of oldgrowth and rainforest in the reserve system opened up for logging could significantly increase over time.
9. Over-logging Since the Buyback

In 2014 the NSW Government paid Boral $8.55 million to buyback WSA commitments of 50,000 m$^3$/yr of High Quality Sawlogs for the remaining 9 years of their WSA. Around 40,000 m$^3$/yr was Large HQ Sawlogs and 10,000 m$^3$/yr Small HQ Sawlogs. This is a total of 450,000 m$^3$ of HQ sawlogs, which equates to the NSW Government paying a private sawmiller $19 per cubic metre for the rights to timber from public lands that was gifted to them for free.

The Minister for Primary Industries, Katrina Hodgkinson (24 June 2014), claimed that the buyback was needed to avoid "dramatically reduc[ing] the volume of timber supplied to industry after 2023" and bring "the supply of timber from the region’s forests back to a sustainable level".

Since the Boral buyback, over the 3 years 2014/15 to 2016/17 the Forestry Corporation have overcut Large HQL by 55,051 m$^3$, and undercut Small HQ Logs by 21,992 m$^3$ giving a total overcut of 33,129 m$^3$ of HQL.

<table>
<thead>
<tr>
<th>WSA</th>
<th>Actual Cut</th>
<th>Difference</th>
<th>WSA-yields</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Large HQL m3</td>
<td>Small HQL m3*</td>
<td>TOTAL</td>
</tr>
<tr>
<td>2014/15</td>
<td>148,067</td>
<td>78,254</td>
<td>226,321</td>
</tr>
<tr>
<td>2015/16</td>
<td>142,749</td>
<td>77,584</td>
<td>220,333</td>
</tr>
<tr>
<td>2016/17</td>
<td>142,757</td>
<td>77,696</td>
<td>220,453</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>433,573</td>
<td>233,534</td>
<td>667,107</td>
</tr>
</tbody>
</table>

HQL logged over 3 yrs after the Boral buyback compared to commitments.

*Note that Small HQL have not been adjusted for poles.

The Forestry Corporation's data on WSA commitments and yields is inconsistent, so this data is only an approximation from a variety of FC sources.

It is Large HQL that are the resource modelled to be declining to below WSA commitments the fastest. They are the most valuable resource and were the principal target of the buyback. It cost NSW taxpayers $1,045,969 to buyback these 55,051 m$^3$ Large HQL in an attempt to reduce yields to sustainable level. It is thus outrageous that these logs are being resold to sawmillers.

Data was obtained for the years 2015/16 and 2016/17 on the volumes obtained from plantations which shows that plantations represent 5.5% of the cut of HQL.

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2017</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Large HQL</td>
<td>Small HQL</td>
<td>Large HQL</td>
</tr>
<tr>
<td>Native Forests</td>
<td>156,539</td>
<td>69,635</td>
<td>162,117</td>
</tr>
<tr>
<td>Plantations</td>
<td>4,850</td>
<td>2,508</td>
<td>11,061</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>161,389</td>
<td>72,143</td>
<td>173,178</td>
</tr>
</tbody>
</table>

HQL logged over 2yrs after the Boral buyback by source.

As identified in the previous section over the period 2004-2014 plantations provided 14% of HQLs. Over the period 2017-2028 plantations are expected to provide 11% of the resource, over the period 2029-2040 16% of the resource, and 22% of the resource over the next 100 years. It is thus evident that as plantations provided 5.5% of the cut, that native forests are providing a disproportionate proportion of the overcutting.

After being informed that the IFOA was based on modelling that 237,000 m$^3$/yr of HQL as available, I expressed concerns (19 June 2018) to NRC that this was a significant increase in commitments.
The NRC (pers comm 20/06/2018) assured me that "The Commission has not reported or made any claim that there will be an increase in wood supply arising from the coastal IFOA remake. The Government’s twin commitment requires no net change to wood supply." Though the actual cut in 2015/16 and 2016/17 shows that the Forestry Corporation has indeed increased supply.

It is apparent that aside from one year the Forestry Corporation have been continuing to log HQL at the levels akin to what they were before the 2014 Boral buyback. It seems the buyback has been a very expensive exercise to enable the Forestry Corporation to go on over-logging public forests. The more they log now, the greater the shortfall in later years and the greater the volumes of oldgrowth forest they can claim to need to log to make up the difference.

Yields of High Quality Logs compared to WSA. It is hard to identify what the Boral buyback achieved in reality. Note that poles were excluded from this table due to problems with identifying WSA for poles and classification of poles as HQL.

Percentage change between actual yields compared to WSA. Note that poles were excluded from this table due to problems with identifying WSA for poles and classification of poles as HQL.

Note:
For 2015/16 data provided by the EPA and NRC (2018) gives yields of HQL totalling 233,532 m³. This compares with 233,289 m³ from other data provided by FC, with the 243 m³ difference due to different figures for poles (25,692 vs 25,499 m³ respectively)

For 2015/16 data provided by the EPA and NRC (2018) gives cuts of 173,178 m³ Large HQL and 74,503 m³ Small HQL, totalling 247,681. This compares with 247,120 m³ from other data provided by FC, with the 562 m³ difference due to different figures for poles (35,745 vs 35,183 m³ respectively).
10. Creating new WSA Commitments

The FRAMES modelling does not extend to low value products and the variable estimates of the volumes available appear to be informed guesses rather than accurate predictions. According to the Forestry Corporation the current "commitments" from north-east NSW are for some 220,000 tonnes/yr of low quality logs and 100,000 tonnes/yr of pulp/firewood. These figures were increased in 2017 to be some 586,000 tonnes/yr of pulpwod and decreased again in 2018 to be 321,850 tonnes/yr of pulpwod. These later figures appear to be predicated on the introduction of the new intensive logging regime.

Without waiting for the new rules to be adopted the Forestry Corporation (2018) have completed an Expression of Interest for 416,851 tonnes/yr of low quality sawlogs and residual logs from north east NSW’s native forests and plantations, which they intended to be issued as 10 year WSAs in June 2018 (it is not known whether these new WSAs have already been issued). These volumes are in addition to 132,249 tonnes/yr of already committed low quality sawlogs.

Once the new WSA are issued there will be commitments for 549,100 tonnes/yr of low quality sawlogs and residual logs, which comprise 75% of the total resource. Aside from the folly of issuing new WSA based on guesstimates, it seems that the intent is to reallocate plantations being used to provide 22% of current commitments of HQL in WSA (extended for 100 years) to low quality logs and be allocated in new WSA to other millers.

In 2017 the NSW Department of Primary Industries (2017b) identified the potential availability of forestry residues for bioenergy generation and other applications on the North Coast of NSW, for three main regional “hubs”: Bulahdelah, Kempsey and Grafton. They considered that "the dramatic reduction in the demand for pulp logs in the region since 2013 has increased wastage and operational challenges (e.g. increased fuel loads); limited forest management options (by reducing thinning opportunities), and reduced profit margins".

The assessment identified that around one million tonnes/yr of residual logs are available for burning for electricity in north east NSW. This included 400,000 tonnes/yr of residue logs from public native forests and 186,000 tonnes/yr from hardwood plantations. These were defined as pulpwod:

For native forests, residue estimations were conservative, as we only considered logs that met the specifications for pulpwod as available for extraction (typically 10 cm small end diameter overbark, and a minimum of 2.5 m in length – no species restrictions – and the crown was typically left in the forest). This was partly due to the fact that the local industry already has experience harvesting and transporting pulpwod from the forest. Extracting pulpwod only, means that a significant proportion of the residues generated (stump, bark, leaves, small branches, large and defective stem sections) are left in the forest, helping mitigate impacts on biodiversity (Chapter 6) and future nutrition needs of the forests (Chapter 5). We have estimated biomass from residues generated from planned integrated harvest operations which target the production of sawlogs, poles and salvage logs.

The Forestry Corporation (2018) are already trying to pre-empt the RFA Review by issuing an Expression of Interest (EOI) for 416,851 tonnes/yr of low quality sawlogs and residual logs from north east NSW’s native forests and plantations. In the EOI issued on 16 March 2018 the Forestry Corporation (2018) identify the total volumes in green metric tonnes as:
Forestry Corporation identified availability of products currently available from north-east NSW. 
Note that the EPA 2017 note "Salvage and pulp products are typically sold by weight, i.e. tonnes. The average conversion of m³ to tonnes is 110%. Though given other figures used by the Forestry Corporation the figures given here for HQ Sawlogs are assumed to be in m³ for all HQL.

This gives a total of 549,100 tonnes/yr of low quality sawlogs and residual logs.

<table>
<thead>
<tr>
<th>Supply Zone</th>
<th>Type</th>
<th>LQ Sawlog (EOI)</th>
<th>Pulp / Residue Logs (EOI)</th>
<th>LQ Sawlog Committed</th>
<th>HQ Log Committed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Zone 1</td>
<td>Regrowth</td>
<td>2,633</td>
<td>14,850</td>
<td>13,567</td>
<td>18,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plantation</td>
<td>50,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply Zone 2</td>
<td>Regrowth</td>
<td>26,332</td>
<td>49,500</td>
<td>27,668</td>
<td>60,000</td>
</tr>
<tr>
<td></td>
<td>Plantation</td>
<td>12,508</td>
<td>43,400</td>
<td>10,692</td>
<td></td>
</tr>
<tr>
<td>Supply Zone 3</td>
<td>Regrowth</td>
<td>39,498</td>
<td>61,500</td>
<td>32,502</td>
<td>80,000</td>
</tr>
<tr>
<td></td>
<td>Plantation</td>
<td>2,057</td>
<td>68,200</td>
<td>13,443</td>
<td></td>
</tr>
<tr>
<td>Supply Zone 4</td>
<td>Regrowth</td>
<td>2,263</td>
<td>8,250</td>
<td>22,487</td>
<td>15,000</td>
</tr>
<tr>
<td></td>
<td>Plantation</td>
<td>1,481</td>
<td>16,800</td>
<td>319</td>
<td></td>
</tr>
<tr>
<td>Supply Zone 5</td>
<td>Regrowth</td>
<td>658</td>
<td>1,100</td>
<td>2,642</td>
<td>2,000</td>
</tr>
<tr>
<td></td>
<td>Plantation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply Zone 6 (Walcha)</td>
<td>Regrowth</td>
<td>3,374</td>
<td>3,500</td>
<td>3,226</td>
<td>4,000</td>
</tr>
<tr>
<td></td>
<td>Plantation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply Zone 6 (Styx)</td>
<td>Regrowth</td>
<td>4,197</td>
<td>4,750</td>
<td>5,703</td>
<td>6,000</td>
</tr>
<tr>
<td>Total</td>
<td>Regrowth</td>
<td>78,954</td>
<td>143,450</td>
<td>107,795</td>
<td>185,000</td>
</tr>
<tr>
<td></td>
<td>Plantation</td>
<td>16,046</td>
<td>178,400</td>
<td>24,454</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>Regrowth</td>
<td>95,000</td>
<td>321,850</td>
<td>132,249</td>
<td>185,000</td>
</tr>
</tbody>
</table>

Data from the Forestry Corporation’s (2018) EOI showing current commitments and available resources in tonnes per annum. Note that the total volume of committed HQL is given as 185,000 m³/yr, and all plantation timber is identified as low quality sawlogs and residual logs despite 52,000 m³ per annum of HQL (22%) being committed in extended WSAs modelled to come from plantations in the longer term.
Supply zones identified in the Forestry Corporation's 2018 EOI.
The Forestry Corporation are proposing that these new WSA are issued in June 2018 for 10 years (until 2028), and are targeted at the export market (with delivery sites specified as Newcastle and Brisbane). These new WSA are predicated upon the yet unauthorised intensive logging regimes and reduced environmental protections proposed in the new IFOA, as well as dubious resource assessments.

These data show an apparent intent to reallocate all the plantation resource to low quality sawlogs and residual logs and commit them in new WSAs to industry. Plantations are expected to provide 11% of the HQL resource from 2017-2028 and 16% of the resource over the period 2029-2040. It is assumed that the figure of 185,000 represents the modelled yield of HQL in m³/yr available from native forests over the next hundred years (which appears likely - see section 8). The modelled 100 year volumes of high quality sawlogs available from native forests and plantations are 237,000 m³ per annum of HQL, which indicates that some 52,000 m³ per annum of HQL (22%) are modelled to come from plantations in the longer term. The reallocation of this resource to low quality sawlogs and residual logs in new WSA will have significant ramifications on the future availability of HQL for the existing WSAs.

From 1994 until 2004 there was significant expenditure by the NSW and Commonwealth Governments for the Forestry Corporation to establish new hardwood plantations to supplement the long term HQL supply. In north-east NSW 28,500 hectares had been established by June 2014, comprised of 18,300 hectares on land purchased as state forest and 10,200 hectares in joint ventures with private land-owners.

Forests NSW (2011) report on yield forecasts from the post 1994 plantations established in north-east NSW:

*The silvicultural objective for these plantations is to produce sawlogs of comparable size and quality to those from the native forests to supply the local sawmilling industry.*
The basis of this strategy is to supply a constant harvest level of approximately 300,000 m$^3$ for 70 years. This level commences in 2024 to coincide with the transition point set by current wood supply agreements and the corresponding reduction in supply from native forests.

In order to supplement long-term supplies of HQL as an outcome of the RFA the NSW and Commonwealth Governments committed to a hardwood plantation supplementation program as part of the New South Wales Forest Industry Structural Adjustment Package which was expected to produce approximately 125,000 m$^3$/yr. for 10 years commencing in approximately 40 years time (i.e. by 2040). The EPA (2017) note that the program:

... successfully established 9,660 hectares of hardwood plantation areas from NSW Government allocated funding of $27 million, ...

Plantations in north east NSW provide a significant proportion of the anticipated future yields from public lands. The EPA (2017) note:

FCNSW has modelled its entire plantation resource of 34,988 hectares in the North East RFA region, ... This modelling shows that, once mature, the plantations can produce 75,000 m$^3$ p.a. of high quality log products over a 50-year period to augment native forest log yields. This represents about one third of the total sustained yield and significantly supplements the native forest resource for the North East RFA region.

If these WSAs proceed they will lock in all timber modelled and estimated to be available from public native forests and plantations. Judging from previous WSAs these are likely to create significant risk for NSW taxpayers. The risk is particularly high given the apparent intent to allocated the same timber from plantations in existing WSAs for HQL in new WSAs as low quality logs.

11. Unaccounted Factors Affecting Timber Yields

The NRC (2016) recognises the future risks to forests provided by climate change:

Climate change has the potential to impact forests and their environmental values by causing changes in species distributions, community composition and forest structure, tree regeneration and growth rates, as well as disruption of biotic processes that provide ecosystem services.29

... The overall impact of forecast climate change on the forestry sector in NSW is projected to be negative.33

As well as impacting environmental values, changes to forest ecosystems have a direct consequence on the capacity of forests to provide timber products. The capacity of eucalypt trees to adjust and cope with periodic drought and chronic increases in aridity is very limited. This means some, if not all, eucalypt forests are at high risk of reduced productivity and possibly widespread drought-induced forest mortality under changing climatic conditions.34

Despite this recognition of the risk, no attempt has been made to factor in a buffer for yield forecasts to account for potential future growth and yield declines due to climate change.

Similarly the NRC identify the risk posed by Bell Miner Associated Dieback (BMAD) though fail to take into account the resource declines due to existing BMAD (except for one small area, see
Section 8.2), let alone likely increases as logging spreads BMAD into susceptible stands. It appears that increasing moisture stress due to climate change is already increasing the spread and severity of BMAD.

11.1. Logging Dieback

Bell Miner Associated Dieback (BMAD) occurs when canopy trees are removed allowing lantana to dominate the understory. The open canopy and dense lantana understory allows Bell Miners (Bellbirds) to dominate the forest, chasing away most other animals. The Bell Miners "farm" tiny sap-sucking insects called psyllids that feed on eucalypt leaves, which proliferate and drain the life out of the eucalypts which sicken and eventually die. When BMAD is advanced it can be identified from the air by the dead and dying trees.

BMAD is a problem throughout coastal NSW.

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

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

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

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

The unanimous resolution of the Bell miner Associated Dieback (BMAD) National Forum, Proceedings (BMAD Working Group 2005) was:

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

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

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

*We, the undersigned, respectfully request your immediate attention to the enormous threat of Bell miner Associated Dieback in Australia's eucalypt forests.*
It has long been evident that the removal of canopy and extensive soil disturbance caused by logging is the principal cause of lantana invasion and the initiation of dieback (i.e. see Pugh 2014, 2018). For example the NSW Scientific Committee’s (2008) final determination for listing ‘Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners’ as a Key Threatening Process notes that:

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

Silver and Carnegie’s (2018) conceptual model of BMAD is their principal outcome, it once again identifies “activities that thin or remove canopy” (a.k.a. logging) as a primary instigator of BMAD, yet it also shows that there has been little progress since Stone (1999) developed a similar model 19 years ago.

Yet again Silver and Carnegie (2017) found that the literature supports that logging is primary cause of dieback without clearly saying so. The process of BMAD has been identified for over 20 years, and the process is once again confirmed to be:

1. Reduction in density of overstorey canopy, or creation of gaps in the overstorey results in an increase in density of understorey plants, particularly the weed lantana
2. Lantana outcompetes and suppresses native species, creating a dense understorey which is ideal for nesting by Bell Miners (Bellbirds)
3. Aided by the open overstorey, Bell Miners aggressively mob other bird species (and predators and diurnal arboreal species) to exclude them from their territories
4. The reduction in predators of the sap-sucking psyllids, coupled with the preferential feeding of Bell Miners on the psyllids sugary coatings (lerps) leaving the psyllids intact, enables populations of psyllids to proliferate.

5. Psyllids primarily feed on the leaves of eucalypt trees causing defoliation. The trees use their carbohydrate stores to produce new foliage with the young leaves even more attractive to psyllids.

6. Repeated defoliation depletes tree's carbohydrate stores, allowing for an increase in attack by secondary pests (such as wood-borers) and disease, and causing trees to sicken and die. Once a tree's carbohydrate stores are sufficiently depleted they may be unable to recover.

NRC (2016) identify:

BMAD presents a potentially significant risk to NSWs forests. Forest dieback can have serious impacts on forestry economics, biodiversity, and landscape aesthetics. There is also a considerable risk that the rate and extent of BMAD may accelerate as the magnitude of factors stressing forest ecosystems become larger in response to future shifts in climate and land-use intensification.

The 2018 aerial visual sketch-mapping (Silver and Carnegie 2017, and subsequent updates) is claimed to have covered some 1,250,000 hectares of forest north from Taree, with 44,777ha of BMAD mapped. Comprised of 17,005ha on State Forest, 12,822ha on National Park, 1,540 on Crown Land, 12,885ha on private property and 525ha on plantations.

Though the evidence (Pugh 2018) is that the output of the aerial visual sketch-mapping grossly understates the true extent of BMAD affected forests, for example in 2005 (Stone et.al. 2005) a collaborative process by NSW Agencies used high resolution multi-spectral imagery (DMSI) to map BMAD across 30,000ha of the Richmond Range.

For the study 24 ground plots were assessed, which confirmed “an apparent relative association between unhealthy eucalypt crown condition, higher site fertility (i.e. higher soil ammonium content and a low soil carbon to nitrogen ratio), high shrub cover, low tree crown cover and high bell miner density”.

For the entire 30,000 ha Richmond Range study area the results provided the following areas within each category.

<table>
<thead>
<tr>
<th>Category</th>
<th>Percent area</th>
<th>Total area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy sclerophyll tree crowns</td>
<td>30%</td>
<td>9,000</td>
</tr>
<tr>
<td>Mildly affected (slightly stressed) trees crowns</td>
<td>20%</td>
<td>6,000</td>
</tr>
<tr>
<td>Moderately to severely BMAD affected trees</td>
<td>29%</td>
<td>8,700</td>
</tr>
<tr>
<td>Mesic vegetation including rainforest species and visible lantana (healthy)</td>
<td>7%</td>
<td>2,100</td>
</tr>
<tr>
<td>Non tree features (shadow, water, soil and grassland/pasture)</td>
<td>14%</td>
<td>4,200</td>
</tr>
</tbody>
</table>

Health of forests mapped across 30,000 hectares of the Richmond Range in 2004 (Stone et.al. 2005)

This study provides the best data available to ground truth the 2018 mapping. It shows that the aerial visual sketch-mapping exercise grossly under-estimated the extent of BMAD. The Richmond Range study identified 14,700 ha (49%) as being affected by BMAD, compared to the 2018 aerial visual sketch-mapping only identifying 5,600 ha as affected within the same area. So, if the forest
has not recovered, it appears that the aerial 2018 visual sketch-mapping is grossly under-estimating BMAD by some 62%.

It is astounding that there is still no reliable assessment of the extent of BMAD in north-east NSW. The recent mapping by DPI Forestry identifies 17,005 ha of native forests on State Forests and 525 ha on plantations north from Taree, though the evidence is that it is under-mapping the true extent by 62%, and it still does not cover State Forests south from Taree. There are historical records of extensive BMAD near Gosford and Barrington Tops. It is therefore not unreasonable to assume that there are likely to be well over 50,000 ha of State Forests affected in north-east NSW, which will have a significant impact on the current and future availability of sawlogs from public forests.

Given that BMAD is particularly impacting the more productive forest types, it is already apparent that its impact on timber supply is many times the 4,600 m³/yr reduction of HQ log supply NRC (2016) attributes to 11,000 ha of Endangered Ecological Communities (half of which already appears to be due to BMAD - see section 8.2). It is evident from the recent mapping north from Taree that BMAD is likely to be having at least twice the impact attributed to EECs (i.e. > 10,000 m³/yr) and the impacts could be more than 5 times the impact attributed to EECs just on State Forests in north-east NSW. The impact is rapidly increasing. It is grossly irresponsible for the impact of BMAD not to have been taken into account in current and future yield projections.

It is important to consider that BMAD is largely a product of logging and the Forestry Corporation’s failure to effectively manage lantana, and as such any loss of resource should be at their expense and not the environments.

12. References


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General Purpose Standing Committee No. 5 (2013) inquiry into the management of public land in New South Wales


NSW Government (2014) Project 2023 - North Coast Resources Review


Stone, C. et.al. (2005) Final Report for NRMCA Project NRTB3.03:Remote Multi-Spectral Assessment of Bell Miner Associated Dieback, Appendices - Supplementary Information and Results
