South East Region Conservation Alliance
www.serca.org.au
contact@serca.org.au
PO Box 724 Narooma NSW 2546 AUSTRALIA

Forests and Forestry policies for an Age of Uncertainty

What we are asking of the NSW Government

- Given native forestry's low productivity and loss-making, and its even worse outlook, to instruct the Forestry Corporation of NSW to end its native forest logging, in order to benefit FC's profitable plantation sector, forest environments, and regional climates.
- To develop new institutional arrangements and funding for state forests, giving priority to building their carbon, water, and biodiversity capacities.
- To rule out publicly the use of native forest biomass for electricity generation, biofuels and bioplastics.
- To make an independent reassessment of deforestation for coal mining and fracking farmlands and forests for gas, including the risk of stranded investments from over-investment.
- To develop forest and other land carbon stock and carbon carrying capacity accounts for NSW as a tool for decision making on sectoral climate mitigation policies and land use proposals, especially in state forests.

Contact:
Heather Kenway
SERCA Committee
PO Box 238 Bermagui NSW 2546
heather.kenway@bigpond.com
02 6493 3047 0407 017 989

Forest and forestry policies for an age of uncertainty: issues and recommendations

Australia is in the middle of large structural changes in its industries and its energy economy, with an expectation of ongoing volatility in global and domestic economic circumstances, while facing the prospect of greater extremes in weather events.

It is more than timely that the NSW Government develop new policies and institutional arrangements for forests and the forestry industry. Current policies are outdated, and some elements are already under investigation. SERCA argues that larger changes are needed than are presently envisaged. Current frameworks cannot deliver what they promised.

With smart policy change the NSW Government can deliver all round good outcomes for the forestry industry in NSW and contribute substantially to developing a better framework for tackling the big climate change challenges of our time.

On-going structural change in the industry makes further change inevitable and desirable

- The NSW forestry industry is already heavily dependent on plantation wood – it has the biggest and best forestry processing industry in Australia – and should consider an industry policy review on how to make it even better. The Forestry Corporation of New South Wales (FC) makes profits in this business segment.

- The total plantation area is only 22% of the size of the total area of available native forest, but in 2012-13 it produced 3.2 times the amount of sawlogs and 3.7 times the amount of pulplogs.

- In the Southern Region the yield from native forest logging averages 85 cubic metres per hectare, and it will drop to an average of 45 cubic metres per hectare as the Harvest Plans are implemented – only about 10% of what a mature plantation would yield. Maintaining native forest wood supplies will require on average nearly twice the current areas to be logged.

- Native forests, though large geographically and highly politically contested, are a small part of the industry and continue to lose market share domestically and globally – part of long run structural change. FC makes losses in this business segment.

- FC is reducing staff numbers in its native forest segment to reduce costs, but this cannot eliminate the losses, and runs the risk of further reducing already inadequate environmental protections.

- Retiring native forests from industrial wood production would do much to end the forest wars and greatly improve the financial situation of FC.

- If FC was solely a plantation wood business, freed by Government of its loss-making native forest operations, its before tax profits would have been 80% higher in 2012/13. A more financially robust FC would be better able to support the plantation processing sector (ie rural wealth and jobs – Oberon, Bathurst, Tumbarumba, Tumut, Bombala) through growing quality wood at cost competitive prices.

- Retiring native forests from wood production requires a Government decision (i.e. FC can't make this decision, unlike a normal company).

Shifts in Commonwealth policy will have implications for NSW

- The Commonwealth has begun ending the subsidies of industries far larger than the forestry industry. Both plantation and native forest sectors of the industry are currently subsidised by both Commonwealth and State Governments and have been for decades, in ways that are harmful to both sectors.

- Allowing FC to end its loss-making native forest logging is consistent with Commonwealth policy to end supporting loss-making business or business facing long term fundamental problems (e.g. FC and Boral and South East Forest Exports and Blue Ridge sawmill).

Forests and climate

- The NSW Government has some serious work ahead to develop a better informed, climate aware base for forests and forestry industry policy, and for decisions on mining for coal and gas in forested areas.

- Exiting from native forest logging would maximise the carbon benefits of avoided native forest logging emissions and long–term carbon stock build up. In so doing, NSW could win the benefits of biodiversity and water conservation and a boost to global marketing for tourism and other industries dependent on a clean, green image.

- FC, part of DPI and a small part of industry are advising Government against retiring native forest logging with strongly contested information and analysis on rotation ages, wood yield sustainability, and carbon benefits. They are also encouraging proposals for native forest bioenergy and advanced bioplastics that at a minimum will maintain the conflict and arguably intensify environmentally damaging industrialised logging, and that won't deliver real, lasting benefits to NSW – economically or environmentally.

- Globally, nationally and in NSW greenhouse gas emissions are increasing much faster than the natural world can reabsorb them, and at last a sense of urgency in developing responses is emerging - note recent discussions between the US and China.

- While fossil fuel use has been expanding exponentially questions are now being asked whether over-investment in fossil fuels will end in tears, and in this regard NSW may be very vulnerable.

- Deforestation for coal mines is currently very controversial and unpopular, as is the policy of allowing fracking for gas in farm lands and forests (in response to gas shortages and escalating costs of imports from Queensland).

- Different energy options from coal and gas are far more environmentally benign, have mature technology, and are now more financially attractive. Global and domestic demand and costs for fossil fuels and alternative energy fuels are shifting quite markedly, and so are associated employment opportunities and growth. An assessment of the relative advantages of alternative energy sources to fossil fuel energy would be prudent for purely financial reasons, while noting that use of alternative energy sources could also improve environmental outcomes and reduce conflicts over large tracts of forests.

- It is in NSW's financial interests to investigate these options and also to involve itself in related national and international policy considerations. It can advance its interests and play a valuable role in developing Australian positions, most immediately through the Commonwealth's process for bringing 'harvested native forests' into the national accounts, and preparation of the Emissions Reduction Fund White Paper.

Biodiversity loss

- FC appears to make no budgetary provision for remediation of logged native forests, despite near clear felling techniques that take out understorey as well as trees. Currently it is campaigning to have IFOA prescriptions changed to reduce its already modest pre-logging monitoring costs. (It does not conduct post-logging surveys.) If remediation costs were to be a charge against its revenues, as they are for private plantation growers, they would of course increase its financial losses.

- Habitat loss from logging in NSW's native forests, pushing threatened species closer to extinction, has long been a major cause for public concern – perhaps the most iconic animal being the koala, struggling to survive in coastal forests from north to south of the State. Likewise concerns about the inadequacy and ineffectiveness of State and Commonwealth protection measures, including exemption of logging in RFA areas from Commonwealth law.

- However biodiversity loss has much larger ramifications as well. Current biodiversity loss globally is exceeding the background rate by at least one or two orders of magnitude, and raising serious concerns about its contribution to the possibility of undesired, abrupt, non-linear environmental change – which could occur at a continental or a planetary scale.

- Scientists have identified biodiversity as one of the nine planetary boundaries which if transgressed, singly or in combination, could trigger such a change.

- Australia is a mega-diverse country; here in NSW there is no doubt that native forestry is contributing to degradation of biodiverse forest ecosystems and loss of some species . It is a trend needing to be reversed, and quickly.

- The bad economics of native forestry make it a no-brainer, when compared to the costs of current climatic extremes of heatwaves, bushfires and floods, even more so against the costs of the more extreme events that are predicted.

Recommendations

SERCA considers that most immediately the NSW Government should:

- Instruct Forestry Corporation of NSW to end its native forest logging, given the positive economic and environmental benefits of doing so, and the value of having FC concentrate on what it does best, i.e. grow plantations for the wood processing industries.

- Publicly rule out use of native forest biomass for industrial electricity generation/biofuels or advanced plastics.

- Put a stop to the IFOA review process, investigate the best cost and administrative arrangements, in order to start planning a new institutional framework for State forests currently available for logging.

- Forestry Corporation NSW to continue to manage plantations, with a view to improved performance and improved support for regional communities.

- Inform the Forestry Corporation NSW and the rest of the forestry industry that there will be no roll-overs of wood supply contracts or access to larger areas of State forests; and that existing native forest wood supply contracts will end at the end of this year.

- Open discussions with the Commonwealth about ending the RFAs and negotiating funding for restructuring under Direct Action climate measures.

- Reassess industry policies that ignore scientific advice on the urgency of reducing carbon dioxide emissions if extreme weather events and climate warming are to be mitigated. There is not a lot of time.

- Make an independent assessment of the risk factors for taxpayers of stranded fossil fuel assets, and the unforeseen costs to the State of approving developments when industry misreads the public mood to take action on pollution and climate change.

- Develop a serious and early re-assessment of plans to deforest large areas for mining, and of allowing fracking for short-life supplies of gas.

- Encourage the Commonwealth Government to abandon Labor's policy that encourages offsets of reduced land use emissions against fossil fuel emissions, because that policy is delaying necessary, large cuts in fossil fuel emissions, and because we need more politically stable funding arrangements for carbon storage in public and private land.

- Set in train work to develop a comprehensive set of carbon stock and flows accounts for NSW in harmony with Australia's National Greenhouse Accounts as a basis for making decisions on competing land and water uses for food, fibre and fuel.

- Incorporate carbon carrying capacity information into stock accounts, and apply them to forest management under new regimes as proposed above and for assessing impacts of non-forestry developments on forest areas.

Forest and Forestry Policies for an Age of Uncertainty

List of Appendices

1. Native forestry operations remain a Government loss maker
2. Productivity and sustainability in the Southern Region
3. The NSW South East: Unsustainable ecologically as well as economically
4. The forestry industry is dominated by plantation processors and this is good
5. Plantations are best for wood supplies; native forests are best for long-term carbon storage
6. Carbon stock and flow accounts, carbon carrying capacities, and the argument against offsetting natural resource emissions reductions against fossil fuel emissions
7. Industry pressure for new uses for native forests: native forest based electricity generation and advanced biofuels/bioplastics
8. The Commonwealth's Emissions Reduction Fund Green Paper process and NSW Options in regard to forestry
9. Endangered and threatened species, ecological communities and populations of the South East Bioregion

Appendix 1

Native forestry operations remain a Government loss maker

Forestry Corporation's plantation operations continue to generate solid profits ($111 million over the past three years) selling logs into Australia's cost-competitive plantation processing sector. But its profits are dragged down by heavy losses in its native forestry operations (-$44 million over the past three years). Freed of its loss making native forestry operations, Forestry Corporation's profits would increase overnight by 80% (Table 1).

Table 1. NSW Forestry Corporation – operating profit/(loss) $ million (Source: Forestry Corporation Annual Report 2012/13)

Year ending 30 June	Plantation operations[a]	Native forestry operations[a]	Total[b]
2013	34	(15)	19
2012	32	(16)	14
2011	45	(13)	34

a) Forestry Corporation does not report by growing regime (ie plantation and native forests) which is the most relevant for environmental and economic reasons. Table 1 reports by growing regime using Forestry Corporation unadjusted information. This means that plantation operations include just the softwood estate which accounts for 92% of the plantation estate. The performance of 8% of the estate (ie hardwood plantations) is not reported in the plantation sector. Rather Forestry Corporation reports it together with its native forestry operations. Hardwood plantation operations generate around 10% of the revenue of this sector. (Note: Forestry Corporation in its annual report does not report actual figures disaggregated into native forest and hardwood plantation log sales (m3) or revenue ($). This information is presented graphically.)

b) Operating profit excluding significant items.

Forestry Corporation's native forestry operations will continue to report losses because:

a. Demand for its product continues to decline because its customers – sawmills and chip exporters – continue to lose markets to manufacturers of plantation sawn timber and wood panels and exporters of plantation chips.
b. Sales revenue from its highest $ value product (appearance grade sawlogs) will decline because of diminishing high quality log supply and competition in the flooring market (the Boral experience).
c. It cannot increase log prices without further damaging the commercial viability of the remaining, struggling native forest sawmills and chip exporters.
d. Forestry Corporation's costs can be expected to rise as the commercial consequences of decades of unsustainable logging catch up: diminishing log quality, sourced increasingly from higher cost locations and requiring a larger land area (see Appendix 2).
e. Despite Forestry Corporation's cost reduction effort, there are limits before negative environmental outcomes cut in (e.g. pre logging flora and fauna surveys and post logging monitoring, minimizing sediment disturbance with bridge construction). Pre-logging surveys are inadequate already and post-logging surveys non-existent.
f. Competing in emerging commodity markets (e.g. advanced biofuels and bioplastics) against the plantation sector will be difficult for the same reason that native forest sawmillers have lost significant market share to plantation sawmillers, despite entrenched subsidies on native forest sawlogs: plantation wood is a superior product from the processor perspective and is now supporting a significantly bigger industry in NSW and Australia.

Unlike private sector businesses, Forestry Corporation cannot unilaterally close its loss making activities. This requires a Government decision, similar to that made by the NZ Government in 1999.

Appendix 2

Productivity and sustainability in the Southern Region

Forestry Corporation log production per hectare

Log production per hectare is an important indicator of forestry industry competitiveness.

A preliminary examination of Forestry Corporation's performance using the IFOA Annual Reports on logging operations in 2013, its native forest Harvest Plans covering 200 plus compartments and its softwood plantation productivity performance identifies that:

1. Forestry Corporation's native forest operations in the Southern Region (Eden and South Coast – Southern) were only 1/6 as productive as its softwood plantation operations in 2013 (85 m3/ha compared with 480 m3/ha – Table 1).

2. Log production per hectare in its native forest Southern Region operations is expected to halve from 2013 levels over the life of the harvest plans (85 m3/ha to 45 m3/ha – Table 1).

The very low productivity in the native forest operations is an environmentally determined reality and cannot be changed without loss of environmental values. This is largely why NSW (and other States) invested in softwood plantations: growing wood as a commercially viable agricultural crop to support a commercially viable plantation processing industry generating wealth and employment in rural Australia.

Historically, Forestry Corporation has brought the State's highest productive native forests into production first and, understandably from a commercial perspective, it will continue to prioritise the remaining highest compartments for harvest. But productivity is trending down with native forest log production expected to contract from an average 85 m3/ha to 45 m3/ha over the lifetime of the current harvest plans.

Forestry Corporation's native forest wood production costs will increase substantially over the next few years, all else held constant.

Table 1. Forestry Corporation log production, harvest area and productivity (m3/ha) for the native forest Southern Region and softwood plantations.

	Harvest Plans Southern Region	IFOA Logging Report Eden RFA area 2012 (calendar year)	IFOA Logging Report Southern RFA area 2012/13 (financial year)	IFOA Logging Report Eden and Southern RFA area (2013[b])	Forestry Corporation softwood plantations (2013)
Total volume of logs produced or planned (m3)[a]	1 260 757	196 485	143 979	340 464	
'Net harvest area' (ha)	27 726	1 746	2 281	4 027	
Log production per hectare (m3/ha)	45	113	63	85	480[c]

a. Native forest pulplogs reported in t converted to m3 by multiplying by 0.85.
b. A combination of calendar year (for the Eden Region) and financial year (for the Southern Region).
c. Calculated using an average MAI for Forestry Corporation's softwood plantations of 16 m3/ha/yr and a 30 year rotation time.

Area logged in Southern Region

IFOA Annual report on logging operations Eden RFA and Southern RFA

ha

Eden RFA region (calendar year)

	Estimated total area subject to thinning	Estimated total area subject to logging using alternate coup harvesting	Estimated total NHA that has been logged & thinned combined	Logged area	Net harvest area
2007	1612			1503	5145
2008	977			1128	3069
2009	1656			865	3142
2010	1366			819	2891
2011	1043			685	1938
2012	862			911	1161
2013	822	924	1746		

Southern RFA region (FYJ) South Coast Sub region

	Estimated total area subject to thinning	Estimated total area subject to logging using alternate coup harvesting	Estimated total NHA that has been logged & thinned combined	Logged area	Net harvest area
2008	48			3216	4750
2009	0			3706	5476
2010	0			1866	3097
2011	0			1603	2815
2012	0		2281		
2013	15			2164	2814

Appendix 3

The NSW South East: Unsustainable ecologically as well as economically

Logging NSW's south east native forests is unsustainable and incapable of implementing legal requirements for ecologically sustainable forest management (ESFM). The Government can expect ongoing public campaigning for forest protection on both economic and environmental grounds, and rightly so.

Appendix 9 is a five page list of endangered and threatened species, ecological communities and populations in the South East Bioregion.

With 45% of the gross area of forest available for logging, the sheer size of the list should have been a clear warning that broad scale near clear-felling forestry on comparatively short rotations is incompatible with maintenance of ecological integrity.

Forestry management in the south-east has resulted in dominant species shift in trees and understorey plants, as large tracts of multi-aged trees were converted into single-aged tracts, and this in turn has led to more fire-prone dominant species and a greater fire danger from forests abutting residential properties. There has been a major reduction in large trees across large areas of forest. Within the logged forests loss of habitat has reduced wildlife numbers and pushed koalas and many other animals and birds closer to regional extinction. Protection measures are inadequate. Regional water supplies and quality have been reduced by siltation of waterways, canopy loss and water-hungry regrowth in the forests. Many of the national parks were logged before being put into reserve status, and are still in recovery and unable to maintain all the environmental values of natural forests, much less make up the shortfalls resulting from logging from forests available to the industry.

A warming climate will put more stresses on forest ecosystems. Already there are indications of plants not thriving at lower altitudes where previously they flourished, and animals and birds seeking higher or cooler regions for new habitats.

When woodchipping commenced in 1969 the intention apparently was that what later became the Eden Regional Forest Agreement (RFA) area was to be converted over about 40 years by alternate coupe logging to a predominantly regrowth forest to supply the Eden export chipmill, South East Fibre Exports (SEFE). After the RFA regime was put in place in 1989 earlier intentions to turn the multi-aged forests around Eden into young regrowth for the chipmill seem not to have changed, despite the legal requirement for ecological sustainability.

In a 2008 discussion with former ABS official Terrence Digwood, the then Forests NSW Regional Manager Ian Barnes said: "in Eden, MAF [multi-aged forest] was approximately nil. It had all been removed – almost – in order to make way for regrowth forest…. He advised that a plantation model had been used to model the amount of standing resource…. He said that MAF had a net increment of nil. [Digwood] asked how could you legitimately log it if it had no net increment. He replied that the aim was to produce a net increment by turning it into regrowth."

A different regime – mainly single tree selection - was applied to the South Coast/Southern and Tumut regions when the RFA was developed for those areas in 2002. But as the proportion of regrowth increased and yields dropped in the Eden region, greater inroads were made into the more northern and western areas, to provide additional pulplogs for the Eden chipmill and logs for Blue Ridge and smaller sawmills.

The dominant tree species in the regrowth coupes was silver-top ash (E seiberi), favoured by the chipmill, but a poor sawlog tree. Dominant now in the understorey are casuarinas. Both the seiberi and the casuarina are more fireprone than what they replaced.

The history of logging in the south east under the RFA regime is reason enough to justify calls to end the regime and establish a conservation regime in its place in the Southern Region.

In a submission and addendum to the December 2013 Senate Environment and Communications Committee Inquiry into the effectiveness of threatened species and ecological communities' protection in Australia, Harriett Swift gave detailed accounts of the outcomes for six specific species including the koala, which is barely surviving in the south east, and where temporary protection arrangements (agreed by the Commonwealth and NSW) do not facilitate expansion of existing numbers but increase threats to them by allowing more intensive logging outside the protection areas as compensation to the Forestry Corporation.

Appendix 2 covers the period from 2007 to 2013. The GFC and the Japanese tsunami altered demand for woodchips from Eden and led to large decreases in areas logged. Before the GFC, in order to maintain contracted supplies, the areas logged across the two RFA areas increased from 9568 hectares in 2001-02 to 14388 hectares in 2006-07 (FNSW FOI information to T Digwood). The 'waste', that is whole pulplogs, was around 90% of near clear-felled forests in the Eden RFA area and 80% across the whole southern region. The 'waste' was also of course wildlife habitat and included future (and, many people claimed, current) sawlog trees. It was by then obvious that woodchipping was driving the industry, and that more trees were being logged for the chipmill than were sanctioned by legal requirements. Between the years 1999-2000 and 2006-07 the yields from both areas dropped from122.1 tonnes/hectare to74.8. (Digwood, letter to Minister Ian Macdonald, 13 May 2008)

Areas logged went up to maintain contracted volumes, but royalties did not keep up with inflation. The royalty rate for Eden pulplogs varied between $15 and $20 between 1990 and 2007. Indexed for inflation it should have been $29.84 by 2008. (Digwood letter to Nicholas Roberts FNSW CEO, 19 September 2008)

Royalty rates included a differential to allow for higher transport costs from the South Coast/Southern/Tumut areas compared to Eden. 2006-07 royalty rates for pulplogs were $6.42 a tonne from SC/S and $9.13 a tonne from Tumut. Royalties for pulplogs from Eden were $13.72 a tonne.

The freight subsidy in that year was worth $885,160.

Then Regional Manager for the SE Ian Barnes stated publicly on many occasions that contracted sawlog supplies could not be met from around 2013-15. The Blue Ridge sawlog manager has claimed he will have to retool to take smaller sawlogs, but that uncertainty about future supplies could make the investment unsound.

In response to public protests about what the logging was doing to forest environments Ian Barnes claimed that FNSW was taking out only two and a half to three percent of the available forest a year. If maintained that would imply logging rotations of 33 to 40 years.

That was totally unsustainable for native forest ecosystems. No number or kind of IFOA prescriptions can deal with the resulting habitat loss for native species, many of which require forests with trees up to 200 years old.

Appendix 4

The forestry industry is dominated by plantation processors, and this is good

Structural change in the forestry industry was underway well before the RFA regimes were put in place at the end of the 1980s. Mechanisation reduced jobs. Market preferences have led to 80% displacement of native forest wood by softwood plantation supplies in most products in the construction industry. In NSW the Government has a valuable, profitable softwood plantation sector that supplies the lion's share of wood products required domestically and for exports.

It is the plantation sector that provides the employment and economic opportunities in the forestry industry. One regional example: the newly upgraded plantation based mill at Bombala employs 300 people, more than are employed in logging, woodchipping and sawmilling coastal native forests from Ulladulla to the Victorian border. Contrary to industry propaganda native forestry is far from the economic backbone of the region. If anything it is a constraint on other far less environmentally damaging industries like tourism. The Commonwealth's tourism arm promotes the south east as Australia's Coastal Wilderness Landscape.

The situation in global markets is unlikely to change, because suppliers in other countries have better soils, better and more reliable rainfall, shorter logging rotations, and lower wage, energy and transport costs. Restructured after the tsunami, Nippon Paper (majority owner and manager of the Eden export chipmill) reduced its native forest chip imports, took softwood chips instead. Plentiful hardwood plantation wood (from plantations established through management investment scheme tax concessions) would out-compete native forest supplies if commercial prices were applied to the latter.

Appendix 5

Plantations are best for wood supplies
Native forests are best for long-term carbon storage

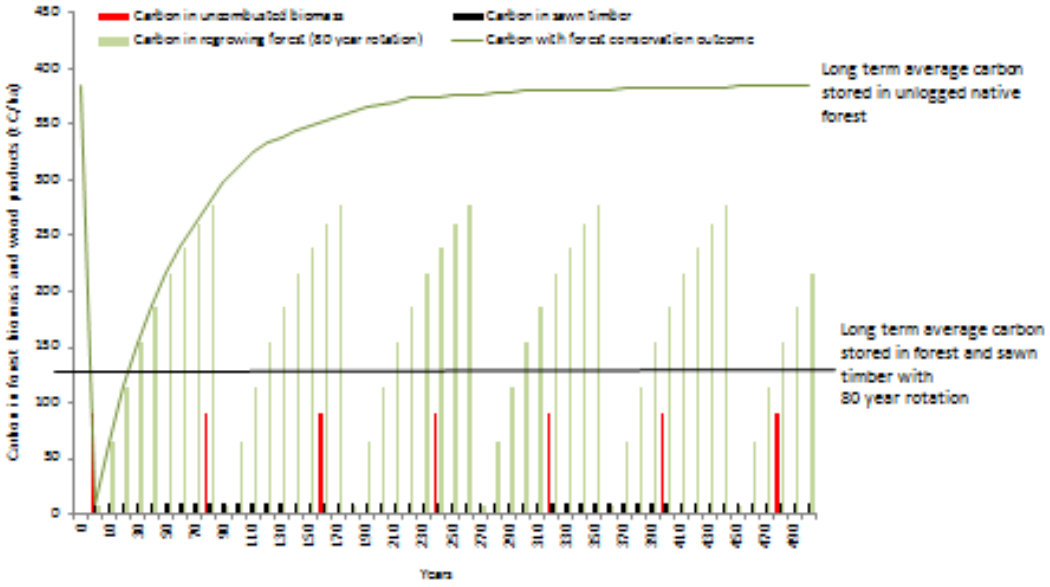
Plantations lack the resilience that biodiversity affords to natural forests. But they have advantages for wood production, and are the preferred input for all but niche products. They require only around a sixth the area of land to produce a set quantity of wood, they produce a more uniform product, and have lower production costs. A fast-growing plantation supplying wood for economic production also provides a high annual rate of CO2 removal. However, the carbon stocks accumulated are relatively small before the plantation is re-logged. They cannot provide for cumulative uptakes of carbon dioxide like native forests undisturbed by logging.

Plantations are more suited to repeat planting and logging cycles, less suited as carbon stores.

The resilience and adaptability to changing climatic circumstances of natural forests gives them the advantage for long term carbon storage. Often overlooked is that while animals and other organisms rely on forest flora for survival, so do the trees and other plants need the animals and organisms to keep them healthy. Biodiversity confers resilience in natural forest ecosystems so that they recover from disturbances such as pest attacks and wild fire and are able to accumulate large stores of carbon, especially in big old trees.

The following graph shows the capacity of a natural forest to accumulate carbon over the long term, and gives a pointer to the loss of storage capacity when plantation style short rotations are applied to native forestry regimes.

With the forestry industry heavily plantation based,
carbon storage is now the best use for native forests
(biodiversity means native forests are very good at long term carbon storage)



Growth trajectory for mixed eucalypt native forest. Carbon in above and below ground biomass but excluding soil. MAI for wood production = 4 m³/ha/yr; r = 80 years, 50% sawlogs, 35% sawn timber recovery, 80 year life for all sawn timber, all other wood goes into bioenergy and combusted in year of logging.

Appendix 6

Carbon stock and flow accounts, carbon carrying capacities, and the argument against offsetting natural resource emissions reductions against fossil fuel emissions

Carbon stock accounts, including details on carbon carrying capacities, provide information that is highly relevant to political decisions to resolve competing demands for food, fibre and fuel from a finite land asset. They are valuable tools for deciding for example whether natural ecosystems should be converted to agricultural or other purposes; setting priorities for restoration of biocarbon stocks through reforestation, revegetation, restoration or improved land management; and for assessing the trade-offs that are involved.

Stock accounts show that retaining natural ecosystems is important because of their relative stability and high accumulated carbon densities, and because of the long time needed to restore carbon stock levels if these ecosystems are degraded. Stock-based information is also needed to investigate climate mitigation options.

Carbon carrying capacity numbers demonstrate the fundamental limits in natural systems - in the atmosphere, in the oceans and on the land. We now know that greenhouse gas emissions into the atmosphere are increasing at a much faster rate than natural systems in oceans and on land can reabsorb them – globally and in NSW.

Acidification of the oceans is a sign that the oceans are close to their absorptive limits. It is a warning sign that allowing exponential emissions increases to continue is to court major upheaval of the climate system, because the land is unable to absorb more than its own limited carbon carrying capacity. The numbers suggest that, on the current emissions trajectory, land carbon carrying limits could be reached within one to two decades. The further emissions reduction task would then fall entirely on the fossil fuel sectors.

That is an extraordinarily short time in which to make major changes to our energy economy, and the outcome could be an erratic climate and an expensive response.

Regrettably, to date governments in Australia and abroad have ignored the importance of stocks and focussed on flows accounts and developed offsets arrangements that have encouraged postponement of serious reductions in fossil fuel usage.

Offsets allowed under the United Nations Framework Convention on Climate Change have contributed to the general sense of complacency.

Clearly large CO2 emissions reductions are needed in fossil fuel use and land management, and quickly, and natural systems need to be allowed to rebuild stocks of carbon to the extent possible.

In Australia we have escalated fossil fuel developments, and started reversing earlier measures to protect natural ecosystems. We have failed to end logging of carbon rich native forests and concentrate on plantation forestry. We have spent far too long thinking in terms of trade-offs between fossil fuel and natural resource sectors, when we should have acted on both. Calculating net emissions and ignoring stocks has obfuscated the seriousness and the urgency of new directions, and let major emitters in both the fossil fuel and the natural resource industries off the hook.

NSW could play an invaluable role in turning Australian policies around. Delay and following a flawed international framework is not in our interests, because we are already seeing what a

warming global climate is doing to our regional climates, and the disruption, cost and human misery that is resulting for the people of NSW.

Appendix 7

Industry pressure for new uses for native forests: native forest based electricity generation and advanced biofuels/bioplastics

The native forestry industry has sought for some years to have the Commonwealth classify native forest biomass electricity generation as clean, green, renewable energy, and eligible to earn tradeable renewable energy certificates, on the grounds that forest biomass other than sawlogs is 'only waste', would be burnt in post-logging burns, and the energy produced would reduce coal use, and the forests would regrow. However:

- The forests cannot regrow, if indeed they do regrow as before, except over many decades to centuries – far too long for the early emissions reductions needed. Meantime their carbon stock is depleted.
- The 'waste' is habitat for wildlife and a vital part of the climate and water cycles. See the list of threatened and endangered species in the SE Bioregion at Appendix 9.
- Without logging there would be no need for post-logging burns.
- Under current Australian rules wood-based energy would displace other renewables, not coal.
- Additionally, many studies challenge the lower-emissions-than-coal argument.

For years the industry was encouraged by the Commonwealth inaccurately 'deeming' logging and burning for electricity to be carbon neutral. Australia's accession to Kyoto 2 requires accounting for native forest carbon and should see an end to this furphy. Australian eucalypt forests are in fact much more carbon dense than European forests, and emissions from logging and burning Australian native forests are much higher than European emissions.

The Coalition Government is now reviewing renewable energy regulations, and in its pre-election policy statement committed to re-introduce amendments to the renewable energy regulations allowing 'appropriately scaled' renewable energy initiatives using wood biomass, to benefit from energy initiatives available to other renewable energy sources. (It also said it supported long-term Regional Forest Agreements, reducing the regulatory burden on the forestry industry, and that it would revitalize the Australian forest industry.)

Given this development it would be prudent for the NSW government to investigate the viability of native forest wood based electricity. Investment risk is high. The economics of various renewable inputs to electricity generation are in a state of flux, as are the prices of coal and gas, and demand for electricity from the grid is in decline.

With high and fairly inflexible production costs of logging for native forest biomass in Australia this looks to be a poor option for keeping the native forestry sector going, and a foolish option for a cleaner, greener energy outlook.

NSW is confronted with highly controversial proposals for new uses for forested and agricultural lands, and new uses for native forest wood. It has to make decisions about the value of some short term economic gains from mining for coal and fracking for gas when there are serious questions about impacts on regional climates, and costs to environmental amenity, other regional industries, water quality and availability, and the social disruption and protest that are already emerging.

Under pressure from an industry that has failed to manage the forests sustainably, has lost much of its export hardwood chip markets and faces even stronger competition from other suppliers in the

future, but believes it is entitled to on-going government financial support, the NSW Government is being pressed to allow native forests to be logged and burnt for electricity, and to sign new rolling evergreen 20-year logging agreements.

The NSW Government is considering new rules that would allow industrial scale burning of native forest biomass for electricity generation. The draft regulation proposes even more intensive logging. It targets not only trees that are currently used for wood chipping but also species that are too hard or too red to be used in paper production and all other forest plant material. These include prime koala habitat trees such as forest red gum, iron bark, bloodwood, grey box and woollybutt.

Small scale use of sawmill wastes, for example for energy or heating for small-scale industry is already legal. Sections of the industry are now encouraging a proliferation of proposals for small-scale native forest biomass burning for electricity production, for example for regional hospitals, the cumulative effect of which could be just as damaging as large-scale electricity generation.

Industrial scale native forest electricity generation, as proposed by the forestry industry, would be just as unsustainable as export woodchipping, and require on-going government subsidies.

It would also be a high risk for investors in electricity generation, especially given the rapidly changing cost relativities with genuine renewables like solar and wind, energy efficiency gains, and declining demand for electricity from the grid.

And for all the environmental damage it would entail its contribution to energy supply would be minimal.

Advanced biofuels and bioplastics such as are being investigated by Nippon Paper in Japan would also see Australian native forest woodchip suppliers facing competition from lower cost foreign suppliers as they are in the global paper making market.

At the very least the Government should assess whether the forests are capable of supplying such an industry over the longer term. The productivity analysis in Appendix 2 suggests they would not.

Nippon Paper in Japan (the major buyer of woodchips from Eden, NSW) meanwhile has continued to export chips from Eden despite the export chipmill there running at a loss. From after tax profits of $A11,775,732 in 1998 the losses were $A126,430 in 2011 and $A2,644,516 in 2012. A loss is expected again when 2013 figures become available.

The Commonwealth's Emissions Reduction Fund Green Paper process and NSW Options in regard to forestry

All governments – globally – can expect mounting public pressure to comprehensively address climate change. Recent agreements between the United States and China herald new global initiatives, and Australia has decisions to make on both fossil fuel and natural resource uses including forestry.

It is in NSW's interests to involve itself in national and international policy considerations. It can play a valuable role in developing the Australian positions.

NSW's highly urbanised coastal development faces escalating costs from more erratic storm surges, while hotter and drier conditions are already exacerbating heat waves, drought and bushfire threats across the State. Climate scientists predict more extreme impacts and a hotter and drier future for all of southern Australia.

Until recently native forests and their climate change mitigation potential have been in the background because native forests were excluded from Australia's Kyoto Protocol first commitment period (2008 to 2012) target. Australia has now decided to bring native forests (termed 'Harvested native forests' as a sub-category of forests) into account together with grazing and cropping land. Current high levels of uncertainty about policy implementation will reduce with the Commonwealth Government's Emissions Reduction Fund White Paper, due for release before June.

The net emissions (emissions less removals) trajectory from forest harvesting is currently a Commonwealth Government interest due to its responsibility in negotiating and achieving Australia's greenhouse gas target for the period 2013 to 2020. There is no machinery connecting Australia's target to State native forestry corporations; forestry corporations do not report against forest management (includes harvesting). This is one of the issues being debated through the Commonwealth's Emissions Reduction Fund Green Paper process.

Three schools of thought have emerged.

1. ***The Forestry Corporation of NSW (based on DPI researchers Ximenes et al. 2012)***

   The DPI researchers argue that native forest harvesting is good for climate mitigation and that carbon uptake can be maximized by harvesting. The analysis uses a scenario extending for 200 years using assumptions about the wood products mix and storage life and the substitution of fossil fuels and non-wood products. Scenario analysis however is not relevant to accounting and reporting actuals: significant differences exist between the DPI approach and IPCC guidelines used by the Commonwealth Government to prepare Australia's National Greenhouse Accounts. In the highly unlikely event that the Commonwealth Government adopted the approach advocated by the DPI researchers and credited to forestry the substitution effects of for example bioenergy for fossil fuels, the national greenhouse gas accounts would become incoherent. Accountants do not and cannot make assumptions about how much different products substitute for others and in dynamic markets. Rigor in Australia's national greenhouse gas accounts is essential particularly because the accounts are used to monitor Australia's climate change mitigation performance against globally negotiated targets.

2. ***Credits for native forest management via the Carbon Farming Initiative***

   Consistent with the Australian Government's greenhouse gas accounting methods and UNFCCC associated negotiations, a cessation of native forest harvesting would see emissions reduced and carbon credits earned for increased carbon storage as native forests recover from past harvesting. Both would contribute to Australia meeting its 5% target to 2020 and whatever

target is set post 2020. Because the CFI is a fossil fuel offset arrangement, combustors of fossil fuels could buy the credits in lieu of actual reductions in their fossil fuel emissions. Such an offset funding arrangement, implemented by the former Commonwealth Government, has limited climate mitigation capacity (unless country targets are ramped up) given that fossil fuel emissions are now increasing ten times faster than land based (anthropogenic) net emissions. European concerns about fossil fuel offsetting saw the Durban Conference (2011) limiting forest management credits to 3.5% of national emissions. This is a scientifically valid attempt to put a break on fossil fuel offsetting. If Australia signs onto a Kyoto Protocol second commitment period, land based offsetting of fossil fuel emissions (including increased native forest carbon storage) will also be rightly constrained. The NSW Government interest is to engage in a negotiation with the Commonwealth Government over native forests and climate change mitigation recognizing the interests of both parties.

3. Funding land sector carbon storage without fossil fuel offsetting

This approach would see country emission reduction targets divided into two: one for fossil fuels and one for the land sector. For the land sector, priorities could be science-informed using knowledge about the stability and longevity of the carbon stocks in different ecosystems. Native forests and other natural ecosystems would be high priorities for protection because their biodiversity endows them with greater resilience against disturbance and hence gives these ecosystems longevity and time to build carbon stocks, especially in big old trees. Funding options could include a dedicated portion of government revenue from a carbon tax/price. Whilst this option addresses the fossil fuel offsets problem and therefore gives greater long term funding certainty for land sector carbon storage activities, it would take time to be realized as a globally negotiated outcome.

Critical details are being worked through now about Australia's climate change policy and the role for native forests. State Governments, as owners of Australia's most carbon dense terrestrial ecosystems (because of the large old trees in native forests), have a direct interest in shaping policy.

It is highly likely that NSW would be advantaged by bringing its native forests into Australia's climate change policy under the conservation scenario, not the production scenario as the DPI researchers advocate. For NSW interests, the approach of the DPI researchers (approach 1 outlined earlier and reproduced in the two figures below[1]) requires independent examination within the context of Australia's emerging climate change policy and global negotiated outcomes and accounting realities.

Critical questions for such an examination are:

1. Have not the DPI researchers made the wrong conclusion about the best interests of NSW for the next 60 years for the South Coast forests and the next 40 years for the North Coast forests when carbon stocks remain higher under their conservation scenario than the production scenario?

2. After 2055 – 2075, certainty that the fossil fuel and non-wood products substitution benefits would be realized and also tagged to NSW is required for the production scenario to be beneficial for NSW. What is the prospect of the latter given the reality of trade in the myriad of associated products and current greenhouse accounting systems that are not structured to trace market outcomes? With respect to the substitution assumptions, what effect would the following changes have on the outcome for the production scenario:

    a. Energy efficiency technologies and renewable energy production systems do not remain fixed for 200 years?

[1] As presented in Ximenes F., George B., Cowie A., Williams J. and Kelly G. 2012, Greenhouse gas balance of native forests in New South Wales, Australia. *Forests* 3, pp. 653-683.

b. Plantation made products, not native forest products, do the substitution work over the next 200 years because they are more competitive as already demonstrated in the Australian wood products market?
c. Electricity made using native forest wood does not actually substitute 100% for fossil fuel because either now or sometime in the next 200 years, energy efficiency and/or renewable energy is/becomes economically superior?
d. Carbon stored in wood products becomes an emission source over the next 200 years as sawn timber consumption in general and native forest in particular continues to trend down, meaning the stock of carbon stored in wood products declines?

3. ANU researchers argue that the DPI researchers have used low forest growth trajectories. They argue that for the South Coast forests, a long term average carbon carrying capacity figure of around 200 t C/ha (nearly double that used by the DPI researchers – see their Figure 10 above) is more realistic. This is fundamental information for policy and the reason for these major differences needs to be resolved. What is a realistic estimate of the long term carbon carrying capacity of NSW native forests?

Figure 8. Greenhouse gas (GHG) implications of the "*conservation*" and "*production*" scenarios (t C ha^{-1} sequestered or displaced) for NC forests modelled over a 200 year period.

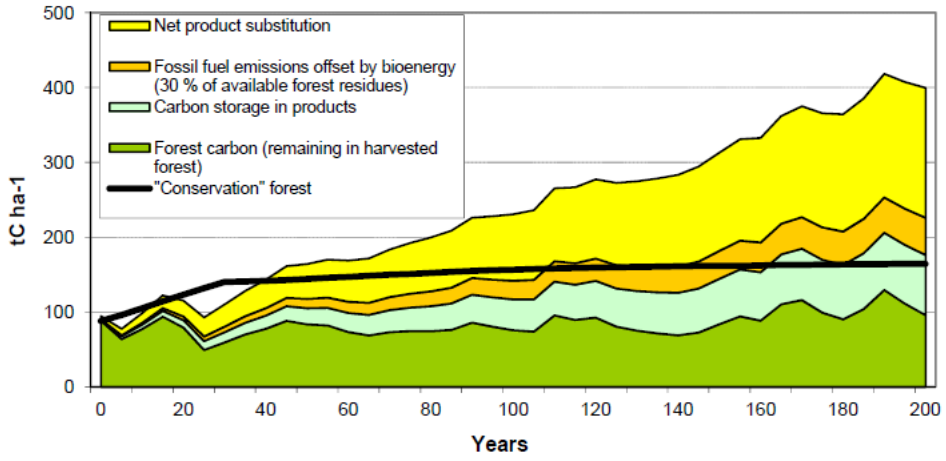
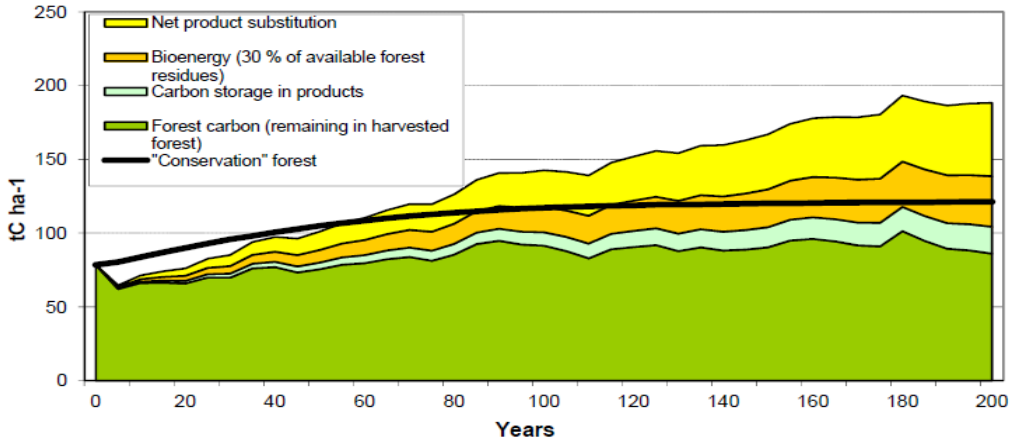


Figure 10. GHG implications (t C ha^{-1} sequestered or displaced) of the "*conservation*" and "*production*" scenarios for SC forests.



Endangered and Threatened Species, Ecological Communities and Populations of the South East Bioregion

(New South Wales listings; Commonwealth listings indicated (+Cth)

Endangered Species

Acacia bynoeana Bynoe's Wattle Plant > Shrubs
Aldrovanda vesiculosa Waterwheel Plant Plant > Aquatic plants
Arthropteris palisotii Lesser Creeping Fern Plant > Ferns and Cycads
Astrotricha sp. Wallagaraugh Merimbula Star-hair Plant > Shrubs
Burhinus grallarius Bush Stone-curlew Animal > Birds
Burramys parvus Mountain Pygmy-possum Animal > Marsupials
Caladenia tessellata Tessellated Spider Orchid Plant > Orchids
Calochilus pulchellus Pretty Beard Orchid Plant > Orchids
Calomnion complanatum Plant > Algae, Mosses and Lichens
Carex archeri Archer's Carex Plant > Herbs and Forbs
Carex raleighii Raleigh Sedge Plant > Herbs and Forbs
Calotis pubescens Max Mueller's Burr-daisy Plant > Herbs and Forbs
Calyptorhynchus banksii graptogyne Red-tailed Black-Cockatoo (south-eastern) (+**Cth**)
Chamaesyce psammogeton Sand Spurge Plant > Herbs and Forbs
Correa lawrenceana var. genoensis Genoa River Correa Plant > Shrubs (+**Cth**)
Cynanchum elegans White-flowered Wax Plant Plant > Epiphytes and climbers
Dampiera fusca Kydra Dampiera Plant > Shrubs
Daphnandra sp. C 'Illawarra' Illawarra Socketwood Plant > Trees
Dasyornis brachypterus Eastern Bristlebird Animal > Birds (+ **Cth)**
Dasyurus maculatus maculates Spot-tailed Quoll, Tiger Quoll (SE mainland population) **(+Cth)**
Dillwynia glaucula Michelago Parrot-pea Plant > Shrubs
Distichlis distichophylla Australian Salt-grass Plant > Herbs and Forbs
Diuris aequalis Doubletail Buttercup Plant > Orchids
Diuris ochroma Pale Golden Moths Plant > Orchids
Diuris pedunculata Small Snake Orchid Plant > Orchids
Ephippiorhynchus asiaticus Black-necked Stork Animal > Birds
Eucalyptus imlayensis Imlay Mallee Plant > Mallees (Critically Endangered) (+**Cth**)
Eucalyptus parvula Small-leaved Gum Plant > Mallees
Eucalyptus saxatilis Suggan Buggan Mallee Plant > Mallees
Eucalyptus recurva Mongarlowe Mallee Plant > Mallees (Critically Endangered)
Euphrasia scabra Rough Eyebright Plant > Herbs and Forbs
Galium australe Tangled Bedstraw Plant > Herbs and Forbs
Genoplesium plumosum Tallong Midge Orchid Plant > Orchids (Critically Endangered)
Genoplesium rhyoliticum Rhyolite Midge Orchid/ Pambula Midge-orchid Plant > Orchids (+**Cth**)
Genoplesium superbum Superb Midge Orchid Plant > Orchids
Gentiana baeuerlenii Baeuerlen's Gentian Plant > Herbs and Forbs
Grevillea acanthifolia subsp. paludosa Bog Grevillea Plant > Shrubs (+**Cth**)
Grevillea renwickiana Nerriga Grevillea Plant > Shrubs
Grevillea rivularis Carrington Falls Grevillea Plant > Shrubs
Hibbertia sp. nov. 'Menai' Hibbertia sp. nov. 'Menai' Plant > Shrubs
Hoplocephalus bungaroides Broad-headed Snake Animal > Reptiles
Irenepharsus trypherus Illawarra Irene Plant > Herbs and Forbs
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern) Animal > Marsupials (+**Cth**)
Lathamus discolor Swift Parrot Animal > Birds (+**Cth**)
Litoria aurea Green and Golden Bell Frog Animal > Amphibians
Litoria castanea Yellow-spotted Bell Frog Amphibians (Critically Endangered)
Litoria raniformis Southern Bell Frog Animal > Amphibians
Litoria verreauxii alpina Alpine Tree Frog Animal > Amphibians
Lysimachia vulgaris var. davurica Yellow Loosestrife Plant > Herbs and Forbs
Macronectes giganteus Southern Giant-Petrel Animal > Birds
Miniopterus schreibersii bassanii Southern Bent-wing Bat (+**Cth**)
Mixophyes balbus Stuttering Barrred Frog Animal > Amphibians
Monotaxis macrophylla Large-leafed Monotaxis Plant > Herbs and Forbs
Monotoca rotundifolia Trailing Monotoca Plant > Shrubs
Neophema chrysogaster Orange-bellied Parrot Animal > Birds (Critically Endangered) (+**Cth)**
Persoonia glaucescens Mittagong Geebung Plant > Shrubs
Petalura gigantea Giant Dragonfly Animal > Invertebrates
Petrogale penicillata Brush-tailed Rock-wallaby Animal > Marsupials

Pimelea axiflora subsp. pubescens Bungonia Rice-flower Plant > Shrubs
Pimelea spicata Spiked Rice-flower Plant > Shrubs
Plinthanthesis rodwayi Budawangs Wallaby Grass Plant > Herbs and Forbs
Pomaderris adnata Sublime Point Pomaderris Plant > Shrubs
Pomaderris cotoneaster Cotoneaster Pomaderris Plant > Shrubs (+**Cth**)
Pomaderris delicata Delicate Pomaderris Plant > Shrubs
Pomaderris elachophylla Lacy Pomaderris Plant > Shrubs
Pomaderris sericea Silky Pomaderris Plant > Shrubs
Pomaderris walshii Carrington Falls Pomaderris Plant > Shrubs (Critically Endangered)
Potorous longipes Long-footed Potoroo Animal > Marsupials (+**Cth**)
Prasophyllum sp. Majors Creek Majors Creek Leek Orchid Plant > Orchids (Critically Endangered)
Prasophyllum affine Jervis Bay Leek Orchid Plant > Orchids (+**Cth**)
Prasophyllum canaliculatum Summer Leek Orchid Plant > Orchids (Critically Endangered)
Prasophyllum petilum Tarengo Leek Orchid Plant > Orchids
Pseudanthus ovalifolius Oval-leafed Pseudanthus Plant > Shrubs
Pseudomys fumeus Smoky Mouse Animal > Rodents (+**Cth**)
Pseudophryne corroboree Southern Corroboree Frog Amphibians (Critically Endangered)
Pterostylis gibbosa Illawarra Greenhood Plant > Orchids
Pterostylis oreophila Blue-tongued Greenhood Plant > Orchid (Critically Endangered)
Pultenaea parrisiae subsp. elusa Elusive Bush-pea Plant > Shrubs (Critically Endangered)
River-Rostratula benghalensis Painted Snipe Animal > Birds
Rulingia prostrata Dwarf Kerrawang Plant > Shrubs
Rytidosperma vickeryae Perisher Wallaby-grass Plant > Herbs and Forbs
Solanum celatum Solanum celatum Plant > Shrubs
Senecio spathulatus Coast Groundsel Plant > Herbs and Forbs
Senna acclinis Rainforest Cassia Plant > Shrubs
Syzygium paniculatum Magenta Lilly Pilly Plant > Trees
Thinornis rubricollis Hooded Plover Animal > Birds (Critically Endangered)
Triplarina nowraensis Nowra Heath Myrtle **(+Cth)**
Tympanocryptis pinguicolla Grassland Earless Dragon Animal > Reptiles
Viola cleistogamoides Hidden Violet Plant > Herbs and Forbs
Westringia kydrensis Kydra Westringia Plant > Shrubs (+**Cth**)
Wilsonia rotundifolia Round-leafed Wilsonia Plant > Shrubs
Xanthomyza phrygia Regent Honeyeater Animal > Birds (+**Cth**)
Zieria adenophora Araluen Zieria Plant > Shrubs (Critically Endangered)
Zieria baeuerlenii Bomaderry Zieria Plant > Shrubs
Zieria buxijugum Box Range Zieria Plant > Shrubs (Critically Endangered) (+**Cth**)
Zieria formosa Shapely Zieria Plant > Shrubs (Critically Endangered) (+**Cth**)
Zieria granulata Illawarra Zieria Plant > Shrubs
Zieria parrisiae Parris' Zieria Plant > Shrubs (Critically Endangered) (+**Cth**)
(**+Cth**) denotes Commonwealth listed species.

Threatened Species of the South East Bioregion

Acacia baueri subsp. aspera Acacia baueri subsp. aspera Plant > Shrubs
Acacia constablei Narrabarba Wattle Plant > Shrubs
Acacia bynoeana Bynoe's Wattle
Acacia georgensis Bega Wattle Plant > Trees
Aprasia parapulchella Pink-tailed Worm-lizard Animal > Reptiles
Baloskion longipes Dense Cord-rush Plant > Herbs and Forbs
Boronia deanei Deane's Boronia Plant > Shrubs
Bossiaea bombayensis Bombay Bossiaea Plant > Shrubs
Bossiaea oligosperma Few-seeded Bossiaea Plant > Shrubs
Botaurus poiciloptilus Australasian Bittern Animal > Birds
Budawangia gnidioides Budawangs Cliff-heath Plant > Shrubs
Calamanthus fuliginosus Striated Fieldwren Animal > Birds
Callistemon linearifolius Netted Bottlebrush Plant > Shrubs
Callitris oblonga Pygmy Cypress Pine Plant > Shrubs
Callocephalon fimbriatum Gang-gang Cockatoo Animal > Birds
Calotis glandulosa Mauve Burr-daisy Plant > Herbs and Forbs
Calyptorhynchus lathami Glossy Black-cockatoo Animal > Birds
Cercartetus nanus Eastern Pygmy-possum Animal > Marsupials
Chalinolobus dwyeri Large-eared Pied Bat Animal > Bats
Circus assimilis Spotted Harrier Animal > Birds
Climacteris picumnus victoriae Brown Treecreeper (eastern subspecies) Animal > Birds
Correa baeuerlenii Chef's Cap Correa Plant > Shrubs
Cryptostylis hunteriana Leafless Tongue Orchid Plant > Orchids
Dasyurus maculatus Spotted-tailed Quoll Animal > Marsupials

Delma impar Striped Legless Lizard Animal > Reptiles
Discaria nitida Leafy Anchor Plant Plant > Shrubs
Dodonaea procumbens Creeping Hop-bush Plant > Shrubs
Eucalyptus aggregata Black Gum Plant > Trees
Eucalyptus kartzoffiana Araluen Gum Plant > Trees
Eucalyptus langleyi Albatross Mallee Plant > Mallees
Eucalyptus pulverulenta Silver-leafed Gum Plant > Mallees
Eucalyptus sturgissiana Ettrema Mallee Plant > Mallees
Euchiton nitidulus Shining Cudweed Plant > Herbs and Forbs
Falsistrellus tasmaniensis Eastern False Pipistrelle Animal > Bats
Fregetta grallaria White-bellied Storm-petrel Animal > Birds
Genoplesium baueri Bauer's Midge Orchid Plant > Orchids
Genoplesium vernale East Lynne Midge Orchid Plant > Orchids
Glossopsitta porphyrocephala Purple-crowned Lorikeet Animal > Birds
Glossopsitta pusilla Little Lorikeet Animal > Birds
Grevillea molyneuxii Wingello Grevillea Plant > Shrubs
Haloragis exalata subsp. exalata Square Raspwort Plant > Shrubs
Heleioporus australiacus Giant Burrowing Frog Animal > Amphibians
Hieraaetus morphnoides Little Eagle Animal > Birds
Irediparra gallinacea Comb-crested Jacana Animal > Birds
Ixobrychus flavicollis Black Bittern Animal > Birds
Kerivoula papuensis Golden-tipped Bat Animal > Bats
Leionema ralstonii Ralston's Leionema Plant > Shrubs
Leptospermum thompsonii Monga Tea Tree Plant > Shrubs
Limosa limosa Black-tailed Godwit Animal > Birds
Litoria littlejohni Littlejohn's Tree Frog Animal > Amphibians
Lophoictinia isura Square-tailed Kite Animal > Birds
Mastacomys fuscus Broad-toothed Rat Animal > Rodents
Melaleuca biconvexa Biconvex Paperbark Plant > Trees
Melaleuca deanei Deane's Paperbark Plant > Shrubs
Melanodryas cucullata cucullata Hooded Robin (south-eastern form) Animal > Birds
Melithreptus gularis gularis Black-chinned Honeyeater (eastern subspecies) Animal > Birds
Miniopterus australis Little Bentwing-bat Animal > Bats
Miniopterus schreibersii oceanensis Eastern Bentwing-bat Animal > Bats
Mormopterus norfolkensis Eastern Freetail-bat Animal > Bats
Myotis macropus(formally Myotis adversus) Large-footed Myotis Animal > Bats
Nematolepis rhytidophylla Nalbaugh Nematolepis Plant > Shrubs
Neophema pulchella Turquoise Parrot Animal > Birds
Ninox connivens Barking Owl Animal > Birds
Ninox strenua Powerful Owl Animal > Birds
Oxyura australis Blue-billed Duck Animal > Birds
Pachycephala olivacea Olive Whistler Animal > Birds
Pandion haliaetus Osprey Animal > Birds
Persicaria elatior Tall Knotweed Plant > Herbs and Forbs
Petaurus australis Yellow-bellied Glider Animal > Marsupials
Petaurus norfolcensis Squirrel Glider Animal > Marsupials
Petroica boodang Scarlet Robin Animal > Birds
Petroica phoenicea Flame Robin Animal > Birds
Petroica rodinogaster Pink Robin Animal > Birds
Pezoporus wallicus wallicus Eastern Ground Parrot Animal > Birds
Phascogale tapoatafa Brush-tailed Phascogale Animal > Marsupials
Phascolarctos cinereus Koala Animal > Marsupials
Pomaderris bodalla Bodalla Pomaderris Plant > Shrubs
Pomaderris gilmourii var. cana Grey Deua Pomaderris Plant > Shrubs
Pomaderris pallida Pale Pomaderris Plant > Shrubs
Pomaderris parrisiae Parris' Pomaderris Plant > Shrubs
Potorous tridactylus Long-nosed Potoroo Animal > Marsupials
Prasophyllum retroflexum Kiandra Leek Orchid Plant > Orchids
Prostanthera densa Villous Mintbush Plant > Shrubs
Pseudomys gracilicaudatus Eastern Chestnut Mouse Animal > Rodents
Pseudophryne australis Red-crowned Toadlet Animal > Amphibians
Pterodroma leucoptera leucoptera Gould's Petrel Animal > Birds
Pterodroma neglecta Kermadec Petrel Animal > Birds
Pterodroma nigripennis Black-winged Petrel Animal > Birds
Pteropus poliocephalus Grey-headed Flying-fox Animal > Bats
Pterostylis pulchella Waterfall Greenhood Plant > Orchids
Ptilinopus superbus Superb Fruit-dove Animal > Birds
Pultenaea aristata Prickly Bush-pea Plant > Shrubs
Pultenaea baeuerlenii Budawangs Bush-pea Plant > Shrubs

Pultenaea parrisiae subsp. parrisiae Parris' Bush-pea Plant > Shrubs
Pultenaea pedunculata Matted Bush-pea Plant > Shrubs
Pyrrholaemus saggitatus Speckled Warbler Animal > Birds
Ranunculus anemoneus Anenome Buttercup Plant > Herbs and Forbs
Rhizanthella slateri Eastern Australian Underground Orchid Plant > Orchids
Rutidosis leiolepis Monaro Golden Daisy Plant > Herbs and Forbs
Rytidosperma pumilum Feldmark Grass Plant > Herbs and Forbs
Saccolaimus flaviventris Yellow-bellied Sheathtail-bat Animal > Bats
Scoteanax rueppellii Greater Broad-nosed Bat Animal > Bats
Sminthopsis leucopus White-footed Dunnart Animal > Marsupials
Stagonopleura guttata Diamond Firetail Animal > Birds
Stictonetta naevosa Freckled Duck Animal > Birds
Suta flagellum Little Whip Snake Animal > Reptiles
Swainsona sericea Silky Swainson-pea Plant > Herbs and Forbs
Thesium australe Austral Toadflax Plant > Herbs and Forbs
Tyto novaehollandiae Masked Owl Animal > Birds
Tyto tenebricosa Sooty Owl Animal > Birds
Varanus rosenbergi Rosenberg's Goanna Animal > Reptiles
Westringia davidii David's Westingia Plant > Shrubs
Wilsonia backhousei Narrow-leafed Wilsonia Plant > Shrubs
Xerochrysum palustre Swamp Everlasting Plant > Herbs and Forbs (Cth listed only)
Zieria murphyi Velvet Zieria Plant > Shrubs
Zieria tuberculata Warty Zieria Plant > Shrubs
Mogo SF

Endangered Ecological Communities

 Brogo Wet Vine Forest in the South East Corner Bioregion -Brogo Wet Vine Forest Community
 Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions
 Dry Rainforest of the South East Forests in the South East Corner Bioregion
 Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions
 Littoral Rainforest in the NSW North Coast, Sydney Basin and South East Corner Bioregions
 Lowland Grassy Woodland in the South East Corner Bioregion
 Melaleuca armillaris Tall Shrubland in the Sydney Basin Bioregion
 Milton Ulladulla Subtropical Rainforest in the Sydney Basin Bioregion
 Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps
 Natural Temperate Grassland of the Southern Tablelands (NSW and ACT)
 Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions
 Southern Highlands Shale Woodlands in the Sydney Basin Bioregion
 Southern Sydney sheltered forest on transitional sandstone soils in the Sydney Basin Bioregion
 Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions
 Swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East
Corner bioregions
 Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions
 Themeda australis - Themeda Grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner bioregions
 White Box Yellow Box Blakely's Red Gum Woodland Box-Gum Woodland Community

Threatened Ecological Communities

Upland Wetlands of the New England Tablelands (New England Tableland Bioregion) and the Monaro Plateau
(South Eastern Highlands Bioregion)

Endangered Populations

Petauroides volans - endangered population Greater Glider population in the Bingi-Congo area of the Eurobodalla LGA
Petaurus australis - endangered population Yellow Bellied Glider population on the Bago Plateau