SOUTH EAST FOREST RESCUE

stoppin the choppin

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THE EDEN NATIVE FOREST FED WOODCHIP POWER STATION PROPOSAL

re•new•able /r{I}'nju:{shwa}bl; NAmE 'nu:/ adj.

1. capable of being renewed. 2. (of energy or its source) not depleted when used. 3. [usually before noun] (of energy and natural resources) that is replaced naturally and can therefore be used without the risk of finishing it all: renewable sources of energy such as wind and solar power.[1]

South East Forest Rescue takes a firm stand on environmental protection of the native forest estate and expresses deep alarm at the welfare of forest-dependent threatened species and the cumulative impacts of industrial degradation of native forests that are exacerbating extinction rates and destroying soil, water, and carbon capacity.

We state from the outset that the scope of the South East Fibre Export's woodchip-fed, native forest burning, power station URS desktop environmental assessment is so narrowly defined it is almost meaningless. The URS assessment could not meet even the basic requirements of the Director General.

Background

Approximately 35 per cent of greenhouse gases in the atmosphere are due to past deforestation, and an estimated 18 per cent of annual global emissions are the result of continuing deforestation.[2] In accordance with the *Rio Declaration,* the *Montreal Process* and the *Intergovernmental Agreement on the Environment 1992,* the *Heads of Agreement on Commonwealth and State Responsibilities for the Environment 1997* stated:[3]

> The Commonwealth has a responsibility and an interest in relation to meeting the obligations under the United Nations Framework Convention on Climate Change, in co-operation with the States, through specific programmes and the development and implementation of national strategies to reduce emissions of greenhouse gases, and to protect and enhance greenhouse sinks.[4]

Following this a nationally ratified policy on reducing GHGs was laid out in the National Greenhouse Strategy 1998 and yet, since these agreements, New South Wales has not furthered mechanisms to assess and arrest Forests NSW's forest degradation or to reduce greenhouse gas emissions of native forest logging.[5] Rather, the increase in hectares of native forest logged and burnt on the south coast over the last two years suggests a 'red-light' mentality, the fear that the woodchipping industry has come to the end of

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[1] Oxford English Dictionary.

[2] Stern N., 'The Stern Review on the Economics of Climate Change: Emissions from the Land-use Change and Forestry Sector,' Cambridge University Press, 2006; Houghton J.T.,'Tropical deforestation as a source of greenhouse gas emissions', (2005) in *Tropical Deforestation and Climate Change*, Moutinho and Schwartzman [eds.]; see also Intergovernmental Panel on Climate Change, *Climate change 2001: the scientific basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change* Houghton JT, Ding Y, Griggs DJ, et al. [eds.], Cambridge University Press, [2001]; see also Food and Agriculture Organization of the United Nations (2005) *State of the World's Forests*, Washington, DC: United Nations.

[3] The Rio Declaration, *Convention on Biological Diversity,* Rio de Janeiro, 5 June 1992, entry into force for Australia: 29 December 1993, Australian Treaty Series 1993 No 32; the *Intergovernmental Working Group in Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests (Montreal Process).*

[4] Council of Australian Governments, November 1997, 'Matters of National Environmental Significance' Attachment 1 Part II (8) < http://www.environment.gov.au/epbc/publications/coag-agreement/index.html >.

[5] In fact, despite these agreements, the State and Federal governments introduced legislation in 1998, the *Forestry and National Park Estate Act 1998* (NSW) and the subordinate Regional Forest Agreements that made logging exempt from environmental impact statements and civil litigation and made no mention of climate change or greenhouse gases.

it's shelf life, driving the felling of forests at an ever increasing industrial rate.[6]

These industrial logging practices contribute significant and continuing emissions of carbon dioxide into the atmosphere which reduce the stock of carbon stored in the ecosystem.[7] On the south coast of New South Wales logging operations in mixed-age, mixed-species forest removes approximately 50% to 90% of existing crown cover.[8] In addition to this, road construction and post-logging burning is resulting in extensive accumulated damage to the environment and the atmosphere.[9] There is little evidence of regeneration after Forests NSW logging, or care of the health of residual trees. Trees are selected for removal based on wood supply agreements to Boral, Blue Ridge Sawmill and South East Fibre Exports woodchip mill.

Over eighty five percent of trees felled are turned into woodchips, either at the Eden chipmill or at the various saw mills on the South Coast and then trucked down to the chipmill. To meet wood supply commitments, the native forest managed by Forests NSW is being cut faster than it is growing back.[10] FNSW have continuously logged over quota since the implementation of the RFAs. Forests NSW and the woodchip mill call these whole logs 'waste'. We believe this to be immoral and uneconomic.

Key Assessment Requirements

The Director General's General Requirements call for a detailed description of the project including:

> indentification of all fuel sources, including the relationship to native forest harvesting.

The URS EA states:

> Only wood waste will be burnt in the Power Plant. No native or plantation forests will be felled for the particular purpose of fuelling the Power Plant.

This was the myth that was used to sell the Eden woodchip mill to the public in the late 1960s.

Pulp load driving straight past Blue Ridge sawmill to the chipmill.

These whole logs are called 'waste'. The erroneous argument is transparently obvious. Trees are felled for sawlogs - but they don't make the grade at the sawmill so are chipped, trees are felled for pulp but they don't make the grade as woodchip therefore they are 'waste'.
This put simply is unacceptable to anyone with a conscience. Luckily there is legal definition for what is deemed waste.

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[6] In 2004/05 FNSW logged 7592ha, in 2005/06 10 709ha, in 2006/07 13 811ha and 2007/08 14 388: *NSW Forest Agreements Implementation Reports* 2005/2006, 2006/2007: Upper North East, Lower North East, Eden and Southern regions, Resource and Conservation Unit, NSW Department of Environment and Climate Change NSW, Sydney; see also Digwood FOI figures 4 Feb, 2008 p2.

[7] Mackey B., Keith H., Lindenmayer D., and Berry S., 'Green Carbon: The Role of Natural Forests in Carbon Storage, Part 1, A green Carbon Account of Australia's South-Eastern Eucalypt Forest, and Policy Implications' ANU E Press, [2008] available at < http://epress.anu.edu.au/green_carbon_citation.html >; *The Stern Review on the Economics of Climate Change*, Summary of Conclusions, <http://webarchive.nationalarchives.gov.uk/+/http:/www.hmtreasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm >.

[8] Often residual crown cover is approximately 10% or less, particularly in the Eden region; this is illegal under the Sthn Region IFOAs which state contractors must leave 55% of net basal area under Single Tree Selection; see FNSW Harvest Plan Compartment 186: Mogo, Batemans Bay.

[9] For photographic evidence see < www.myspace.com/southeastforestrescue >; < http://www.chipstop.forests.org.au/ >; < http://www.serca-online.org >; < http://www.acr.net.au/~coastwatchers/ >; < http://www.fiveforests.net >.

[10] Performance Audit "Sustaining Native Forest Operations," Auditor-General's Report, 2009; "reviews of yield estimates for the southern region, due in 2004 for Eden and 2006 for Tumut and the south coast, have not been completed."

Strategic Justification

There is no justificication in the URS EA for this power station. There is no comparison to other sites considered in the area for the power station, nor comparisons to real renewable technologies.

The town of Eden is favourably located for either wind or solar technologies and yet no mention is made of these alternatives.

The allegation that the woodchip power station will 'improve the reliability of the local electricity supply' is not accompanied by any scientifically driven data. The woodchip mill has been exposed as the sole producer of flicker in the area, therefore they are the cause of electricity problems.[11]

Biomass Materials

Sustainability of native forest logging

The definition of *ecologically sustainable development* had its origins in the report of the World Commission on Environment and Development, *Our Common Future.*[12] Development was defined as sustainable if:

> It meets the needs of the present without compromising the ability of future generations to meet their own needs.

In the international community the term is *sustainable development.* In Australia Bob Hawke had need to place the word *ecological* in front of the phrase as developers believed they now had carte blanche to demolish the environment.[13] Thus the term is now defined in Australia as development that is *ecologically* sustainable.

The RFAs state that their purpose is to:

> provide for the ecologically sustainable management and use of forested areas in the regions.[14]

The definition currently in place is contained within the *Protection of the Environment Administration Act* at s6(2):

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

There is an obvious definite disjunction between what the native forestry logging and woodchipping industry believe is ‘best practice’ and what independent scientists, academics and eighty percent of the community believe is sustainable.

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[11] K.A.Walshe, 'Flicker Frequency Changing Effects with A TSC Applied To A Woodchip Mill' commissioned for SEFE, 1977.

[12] The World Commission on Environment and Development , 'Our Common Future' *The Bruntland Report*, 1987 p8.

[13] Harris and Throsby, 'The ESD Process: Background, Implementation and Aftermath' (1997) a paper presented at a workshop 'The ESD Process Evaluating a Policy Experiment' Hamilton and Crosby eds. Academy of Social Sciences in Australia. ISBN 0 646 365231Hawke, R.J., 'Our country our future' (1989) (Statement on the environment by the Prime Minister of Australia), Canberra: Australian Government Publishing Service.

[14] Regional Forest Agreement for Southern New South Wales between the Commonwealth of Australia and the State of New South Wales April 2001 Recital B (b).

No serious attempt has been made to assess the sustainability of native forest logging in the EA and there is no scientific data to validify their claims. Fuel for the power station will be from hardwood and softwood woodchips and most of these, the URS EA admits, are obtained from logging native forest.

> The majority of the wood received by SEFE is obtained from land managed by Vic Forests and Forests NSW. Both of these agencies achieved AFS certification in September 2006. As a result, over 90% of all wood received through SEFE's gate is certified.[15]

Of course this statement is erroneous. To claim Forests NSW and Vic Forests are sustainably logging because most SEFE chips are produced under the highly controversial Australian Forestry Standard is falsely misleading. Japanese paper manufacturers are increasingly reluctant to accept AFS as an adequate label of sustainability and the biggest company in Japan, Oji, does not accept it.

The native forest woodchipping industry currently uses the discredited AFS, it is a business-as-usual label devised by John Howard's one time Forestry Minister, Wilson Tuckey. It is not taken seriously by anyone who cares about conservation or by the international community, in fact the UK Government, (the CPET Review Committee) declared that the Australian Forestry Standard does not meet the criteria set for its endorsement of Forest Certification schemes, and the Belgium Government has placed the Australian Forest Standard on a B list of forest product providers eligible for Government contracts. Brazil is gearing up to meet the European woodchip demand, not by cutting down forests, but by expanding tree plantations by 27 million hectares, mostly of exotic species such as eucalyptus.

However, ongoing native forest destruction, out of control land clearing for plantation establishment, continued use of 1080 poison, climate-changing pre and post logging burns and inadequate community consultation are driving international condemnation of FNSW forestry practices.

The head-in-the-sand attitude of the Federal Government and industry leaders and their repeated denials of a problem is selling Australia short. These European governments are sending a clear message that our logging practices are unsustainable and that the AFS, far from being 'world's best practice' is in fact second-rate.

Worldwide there is an increasing demand for forest products that come from environmentally responsible suppliers. Australia has a golden economic opportunity to reform its forestry practices and tap into that global market. The native forest logging industry is currently being subsidised by taxpayer money to the value of $9 per person. Micheal Costa lied to the Australian public and the people of NSW when he stated in 2003 that there was no cost to the taxpayer, coming from the native forest logging sector.[16]

The Scott Spencer report confirms observations by conservationists and the community that the Regional Forest Agreements have failed to meet their transparency and sustainability obligations.[17]

If the NSW Regional Forest Agreements were supposed to provide for the 'conservation of areas, for Ecologically Sustainable Forest Management and twenty year certainty for native forest industries', then the results of the Spencer report show clearly that the agreements have failed dismally on all accounts.

FNSW were legislatedly required to produce annual reports of progress on meeting regional ESFM targets in ESFM Plans, and this has not been delivered. This is central to accountability under the RFAs.

> 'The remaining multi-age forests resource is coming to an end in the next two to three years',
>
> Ian Barnes, FNSW Regional Manager, Batemans Bay.

Clause 95.6 requires NSW, in accordance with clause 46(f), to review sustainable yields, consistent with Attachment 11 and FRAMES, in time for the first 5 year review. Failure to comply with this a trigger for

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[15] SEFE URS Environmental Assessment, Ch 2 p16.

[16] Legislative Council Questions and Answers No. 27, Tuesday 28 October 2003, [16 September 2003] (Paper No. 21), NSW Parliamentry Hansard, 435.

[17] *Final Report on Progress with Implementation of NSW Regional Forest Agreements: Report of Independent Assessor*, November 2009 < http://www.daffa.gov.au/__data/assets/pdf_file/0007/1546711/assessors-report.pdf >.

termination of the RFA (cl 99(iv)).

Because the forests have been so heavily overcut, the promised level of supply cannot be met. Forests NSW are logging these important forests and ignoring environment protection rules for the sake of only another two to three years worth of trees. This alone is grounds to terminate the RFAs.

The URS EA was required to report and identify all fuel sources, including the relationship to native forest harvesting and it has failed to do that. It was required to provide a detailed description of each type of biomass fuel, the source of that 'waste', and quantity to be used annually and demonstrate that no native or plantation forests will be felled for the particular purpose of fuelling the proposed power station. It has failed to do that also.

Given the amount of money and time spent on the EA, the failure of URS to provide any adequate information seems indicative of the overall native forest logging industry.

Air Quality

Particulates

A problem with the combustion of raw biomass is that it emits considerable amounts of pollutants such as particulates and PAHs (polycyclic aromatic hydrocarbons). Even modern pellet boilers generate much more pollutants than oil or natural gas boilers. The particulate matter produced in biomass burning may be transported over great distances.[18] Polycyclic aromatic hydrocarbons (PAHs) can be formed by anthropogenic processes or be derived from natural sources. The anthropogenic PAH sources, mainly from combustion processes, are by far the major contributors of hydrocarbons with known health hazards to the environment.[19]

The proposed power station will emit the products of combustion through an exhaust stack 35 metres high. The emissions will largely comprise carbon monoxide, carbon dioxide, nitrogen oxides, particulates and smoke.[20] The EA itself concedes that the heavy metal content of the ash produced will exceed allowable limits.

Wood smoke has caused severe concerns about health effects due to the high PAH content. The most significant health risks related to air quality posed by wood combustion are associated with fine particulates, in particular “inhalable” particulates <10 μm in diameter and “respirable” particulates < 2.5 μm in diameter.

Combustion particulates are very fine with mean particle sizes of less than 1 μm; consequently, mechanical collectors such as cyclones cannot normally achieve emission levels less than 120 mg/m3 for wood combustion (grate or suspension burners). Since the coarser particles are more easily collected, as the efficiency of air pollution collection (APC) equipment increases, the remaining (or penetrating) fraction becomes increasingly fine and even more difficult to collect.[21]

The limited data available indicate that dioxin concentrations in the emissions from smaller boilers

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[18] See Ballentine D.C., Macko S.A. and Turekian V.C. 'Variability of Stable Carbon Isotopic Compositions in Individual Fatty Acids From Combustion of C and C Plants: Implications for Biomass Burning,' 152 *Chemical Geology* [1998] 151; see also Standley L.J., Simoneit B.R.T., 'Characterization of Extractable Plant Wax, Resin, and Thermally Matured Components in Smoke Particles from Prescribed Burns,' 21 *Environment Science and Technology* [1987] 163.

[19] See Bernd R.T. and Simoneit, 'Biomass Burning - a Review of Organic Tracers for Smoke from Incomplete Combustion,' 17 *Applied Geochemistry* [2002] 129.

[20] The pollutants known to be emitted from wood fired power stations are Acetaldehyde, Alpha-pinene, Beta-pinene, Carbon monoxide (CO), Formaldehyde, Methanol, Naphthalene, Toluene, Turpentine, 2,3,7,8 Tetrachlorodibenzo-p-dioxin (TCDD) C/P, 2,3,7,8-Tetrachlorodibenzo-p-furan C, Hydrogen sulphide C/S, Nitrogen oxides (NOx), Beryllium, Cadmium and compounds, Chromium, Cobalt, Copper, Iron, Lead arsenate, Lead chromate, Magnesium, Manganese, Molybdenum, Nickel and compounds, Particulate matter (PM): Phosphorus, Selenium, Silver, Thallium, Zinc, Arsenic and inorganic arsenic compounds, Mercury, Hydrochloric acid, Sulphuric acid, Sulphur dioxide (SO2); 3240 Legislative Council Questions and Answers No. 92, Thursday 26 March 2009.

[21] Technical Support Division, Office of Air Quality Planning and Standards, U. S. Environmental Protection Agency, Research Triangle Park, NC*: Emission Factor Documentation For AP-42 Section 1.6 — Wood Waste Combustion In Boilers*, April, 1993.

burning wood containing salt can be much higher than from large industrial boilers. If chlorine (sea salt or PVC) containing fuels are allowed to be burned in small boilers, more work needs to be done to measure dioxin emissions and determine appropriate control options. The URS EA fails to mention this.

The combustion of wood can result in number of potential pollutants depending on the contaminants in the fuel and the type and completeness of combustion process. The USEPA in AP-42 has identified 90 organic compounds (or groups of compounds), and 26 trace elements (metals) in the emissions from wood combustion. Washington State in 2005 developed emission factors for over ninety (90) chemicals.[22] Then it conducted a risk assessment, including air dispersion modelling, to determine Candidate Pollutants of Concern which, based on their analyses, represent the most significant emissions from wood-fired boilers.

For instance Ethylene is a plant hormone that can affect greenhouse crops, such as tomatoes, in very low concentrations. So although ethylene may not be considered an environmental concern in the ambient air outside of a greenhouse, it can be inside; consequently, if wood flue gas is to be circulated within a greenhouse, the system will have to deal with this gas.[23]

This is publicly available information on emissions and control options for wood combustion systems with a rated capacity greater than 0.1 MW.

The size of particles is directly linked to their potential for causing health problems. Particles of concern are small particles (known as PM2.5 or fine particulate matter), which are less than 2.5 micrometers in diameter. These probably pose the greatest problems, because they can get deep into your lungs, and some may even get into your bloodstream. Exposure to such particles can affect both your lungs and your heart.

Particle exposure can lead to a variety of health effects. For example, numerous studies link particle levels to increased hospital admissions and emergency room visits-and even to death from heart or lung diseases. Both long- and short-term particle exposures have been linked to health problems. Studies have shown that the effects of wood smoke and particulates are equal to those effects caused by vehicle and road emissions.[24]

Short-term exposure to particles (hours or days) can:

a.. Aggravate lung disease causing asthma attacks and acute bronchitis.
b.. Increase susceptibility to respiratory infections.
c.. Cause heart attacks and arrhythmias (abnormal heart rhythms) in people with heart disease.

Even healthy people may experience temporary symptoms such as:

a.. Irritation of the eyes, nose and throat.
b.. Coughing.
c.. Chest tightness.
d.. Shortness of breath.

The groups that are most sensitive to particles are children, older adults and people with heart or lung disease like asthma, COPD, angina, strokes or partially blocked arteries.[25]

During mechanical handling of forest residues, the mould dust concentration at the working area becomes high, which causes health risks. This holds true for the loading and the chipping of residues at different

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[22] Washington State Dept of Ecology:, 'Hog Fuel Boiler RACT Determination' Publication 03-02-009, 2005.
[23] *'Emissions from Wood-Fired Combustion Equipment,'* Envirochem Services Inc. Emissions Report-July 3 2008, prepared for the Environmental Management Branch, Ministry of Environment, British Columbia.
[24] See Kocbach A., Namork E., Schwarze P.E., 'Pro-inflammatory Potential of Wood Smoke and Traffic-Derived Particles in a Monocytic Cell Line,' 247 *Toxicology* [2008] 123.
[25] See Department of Health < http://www.health.nsw.gov.au/publichealth/environment/air/air_pollution.asp > as at 27/03/2010.

stages in the production process, but also for manual work at the end-user. Drivers of trucks and chipmill workers are examples of groups with high risks of exposure. Microbial activity starts directly after logging. At the woodchip mill the predominant species are *Aspergillus fumigatus*, *Penicillium* spp., and *Paecilomyces* spp.[26]

Chip piles and wood dust provide an easily accessible food supply for wood attacking organisms since the wood is finely divided and the protective lignin shield around the cellulose may be broken.[27] The temperature in a chip pile can reach up to 700°C, and thus the growth of thermophilic and thermotolerant fungi occurs.[28] The most prevalent species are *Aspergillus fumigatus*, other *Aspergillus* species and *Penicillum* species.

The fungal spore concentration at chip piles varied between 104 to 105 spores/m3. Hardwood chips are more easily infected by fungi than chips of coniferous wood (Thörnqvist and Lundstrom, 1982).[29] A study of biohazards in composted wood chips found that the endotoxin levels of the bulk material ranged from 98.92 to 934.68 EU/mg, while the airborne levels of endotoxins were 636.52 EU/m3 in inspirable dust and 771.79 EU/m3 in respirable dust.[30] The concentration of Gram (-)ve bacteria in bulk were 7.9x109 CFU/g and in airborne dust 2.9x105 CFU/m3. Predominant fungi identified in the bulk material were *Aspergillus fumigatus*, *Aspergillus niger*, *Penicillium* spp., *Rhizopus microsporus*, and *Absidia* sp. The predominant fungi in the dust were *Aspergillus fumigatus*, *Aspergillus niger*, *Penicillum* spp., *Rhizopus stolonifer*, *Cladosporium* sp. and *Trichoderma* sp.

Insidious subacute development of allergic alveolitis can result from prolonged exposure to low concentrations of fungi. *Penicillium* has also been reported as the causative agent in fuel-chip induced hypersensitivity inhumanities. *Aspergillus fumigatus* and *Fusarium* spp. are known pathogens, which can cause infection or toxicosis in humans and animals. Multivariate analyses showed that the effect of all the personal exposures on cross-shift decrements in lung function was more prominent among sawmill and chip mill workers.

Mycotoxins can cause various toxic effects in humans. Acute and chronic respiratory diseases were reported after inhalation of organic dust containing toxigenic moulds and mycotoxins, respectively.[31] Prolonged exposure to organic dust and previous episodes of acute pulmonary reactions after mould dust exposure lead to chronic bronchitis and loss of lung function.[32] The activation of macrophages with consecutive inflammatory reaction plays a crucial role in these effects of bioaerosols (especially when the dust contains high amounts of endotoxins).[33] Toxigenic moulds of the genera *Aspergillus* and *Penicillium* are predominant in the dust therefore inhalation of mycotoxins contribute substantially to the observed adverse health effects.

Epidemiological studies have associated exposure to ambient particulate matter, in general, with cardiovascular and pulmonary morbidity and mortality. Recent studies suggest that exposure to wood

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[26] Alwis K., 'Occupational Exposure to Wooddust' available online <http://ses.library.usyd.edu.au/bitstream/2123/392/2/adt-NU1999.0018whole.pdf> 9 April 2010; see also Alwis KU, Mandryk J, Hocking AD 'Exposure to Biohazards in Wood Dust – Bacteria, Fungi, Endotoxin and (1->3)-β-D-glucan,' *Applied Occupational Environmental Hygiene* [1999].

[27] Rossell S.E., Abbot E.G.M., Levy J.F., 'Bacteria and Wood - a Review of the Literature Relating to the Presence, Action and Interaction of Bacteria in Wood,' 6 *Journal Institute Wood Science* [1973] 28.

[28] Jappinen P., Pukkala E., Tola S., 'Cancer Incidence of Workers in a Finnish Sawmill,' 15 *Scandanavian Journal of Work Environmental Health* [1998] 18.

[29] Thörnqvist T. and Lundstrom H., 'Health Hazards Caused by Fungi in Stored Wood Chips' 32 *Forest Products Journal* [1982] 29.

[30] Olenchock S.A., Sorenson W.G., Kullman G.J., Jones W.G., 'Biohazards in Composted Wood Chips' 8 *Biodeterioration and Biodegradation.* [1991].

[31] See Bünger J., Westphal G., Mönnich A., Hinnendahl B., Hallier E., Muller M., 'Cytotoxicity of Occupationally and Environmentally Relevant Mycotoxins,' 202 *Toxicology* [2004] 199.

[32] See Dalphin, J.C.H., Pernet, D., Dubiez, A., Debieuvre, D., Allemand, H., Depierre, A., 'Etiologic Factors of Chronic Bronchitis in dairy farmers. Case control study in the Doubs region of France,' 103 *Chest* [1993] 417.

[33] See Christiani, D.C., 'Organic Dust Exposure and Chronic Airway Disease,' 154 *American Journal Respiritory Critical Care Medicine* [1996] 833.

smoke may affect both respiratory and cardiovascular health.[34] Inhaled particles deposited in the lung can interact with macrophages and epithelial cells to induce the release of a complex cascade of inflammatory signalling proteins like cytokines, chemokines and growth factors.[35] Proinflammatory cytokines such as tumour necrosis factor(TNF), interleukin (IL)-1 and IL-8 may initiate and exacerbate inflammation.[36]

The proposed site of the power station is less than three kilometres directly south of Eden in Twofold Bay.[37] On the South Coast the high wind season, which is in August through to October, is predominated by wind that blows in a southerly direction, making the township of Eden a direct target for emission fallout.

A recent report on the effects of heavy metals in pregnant women is of great concern. This report shows the link between heavy metals in-utero and hypospadias (penis defects) in babies. Hypospadias is a urogenital birth defect affecting infant boys. Periconceptual parental occupational exposure to endocrine disrupting chemicals (EDCs) with oestrogenic or anti-androgenic properties may adversely affect male genital development in-utero. Multivariable analysis showed a strong association with potential maternal occupational exposure to heavy metals with an over two-fold increased risk of hypospadias (Odds Ratio (OR) 2.6, 95%CI 1.3 to 5.2) and women exposed to phthalates were more likely to have an affected son (1.2, 0.8 to 1.7). Compared with mild or isolated cases, the risk of moderate-severe hypospadias or multiple defects were increased up to 2 and 5-fold, respectively with maternal exposure to most types of EDC. Paternal occupational exposure to polychlorinated organic (OR 1.3, 95%CI 1.0 to 1.8) and bi-phenolic (OR 1.6, 95%CI 1.0 to 2.6) compounds were also possible risk factors.[38]

Water Quality

Marine Water Quality and Ecosystems

The SEFE woodchip mill is situated in Eden at Twofold Bay. Twofold Bay provides important habitat for endangered and threatened marine life, cetaceans and migratory birds. Many bird species are listed under JAMBA or CAMBA and known to occur in the area.[39] The SEFE land is foreshore land that also adjoins the Ben Boyd National Park, Towamba River and Twofold Bay estuary. It is an iconic tourist destination for whale watching. Twofold Bay is the only ocean embayment in the Twofold Shelf bioregion and the

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[34] See Boman, B.C., Forsberg, A.B., Jarvholm, B.G., 'Adverse Health Effects from Ambient Air Pollution in Relation to Residential Wood Combustion in Modern Society,' 29 *Scandanavian Journal of Work Environment and Health* [2003] 251; see also Naeher, L.P., Brauer, M., Lipsett, M., Zelikoff, J.T., Simpson, C.D., Koenig, J.Q., Smith, K.R., 'Woodsmoke Health Effects: a Review,' 19 *Inhalation Toxicology* 2007] 67; see also Barregard, L., Sallsten, G., Gustafson, P., Andersson, L., Johansson, L., Basu, S., Stigendal, L., 'Experimental Exposure to Wood-Smoke Particles in Healthy Humans: Effects on Markers of Inflammation, Coagulation, and Lipid Per Oxidation,' 18 *Inhalation Toxicology* [2006] 845.

[35] See Salvi, S., Holgate, S.T., 'Mechanisms of Particulate Matter Toxicity,' 29 *Clinical Exposure Allergy* [1999] 1187.

[36] See Kocbach A. et al, above n 24.

[37] SEFE originally stated the project was 35km from Eden, by road this is not an untruth.

[38] Nassar N., Abeywardana P., Barker A., Bower C., 'Parental Occupational Exposure to Potential Endocrine Disrupting Chemicals and Risk of Hypospadias in Infants,' *Occupational Environmental Medicine* doi:10.1136/oem.2009.048272.
< http://www.smh.com.au/lifestyle/wellbeing/heavy-metals-raise-risk-of-penis-defects-20091202-k6es.html >;
< http://oem.bmj.com/content/early/2009/11/25/oem.2009.048272.short?q=w_oem_ahead_tab >

[39] *Japanese Australian Migratory Bird Agreement* Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds in Danger of Extinction and their Environment (Tokyo, 6 February 1974) Entry into force: 30 April 1981 *Australia Treaty Series 1981* No 6*;Chinese Australian Migratory Bird Agreement* Agreement between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment (Canberra, 20 October 1986)Entry into force: 1 September 1988 *Australia Treaty Series 1988* No. 22; the hooded plover (*Thinornis rubricollis*) and the shy albatross (*Diomedea cauta*), black-browed albatross (*Diomedea melanophrys*), sooty albatross (*Phoebetria fusca*) and pied oystercatcher (*Haematopus longirostris*) beach stone curlew, bush stone curlew, humpback whales (*Megaptera novaeangliae*) southern right whales (*Eubalaena australis*) and blue whales (*Balaenoptera musculus*) as well as other cetaceans including dolphins and pilot whales, the shorttailed shearwater (*Puffinus tenuirostris*), australian reef egret (*Egretta sacra*), white-bellied sea-eagle (*Haliaeetus leucogaster*) and grey plover (*Pluvialis squatarola*) little tern (Sterna albatross), black bittern (Lybrychs flavicollis), sooty oystercatcher (Haematopus fuliginous), pied oystercatcher (H. longirostris), sanderling (Calidris alba) and lesser sand plover (Chardris mongolus). Fish such as black cod, seahorses, benthic organisms, poseidon seagrass populations and habitat; the power station will have two process water requirements. Boiler make-up water will be required to replace blow-down water at the rate of 1 – 1 ½ % of the steam flow rate, or about 275 litres per hour and sea water will be used to dissipate the heat and be pumped from a point on SEFE's wharf, through the heat exchanger and returned to the sea some 15 – 20 degrees warmer; "Giant Kelp has receded to Tathra because of warming ocean temperature levels," Dr Alan Millar, Royal Botanical Gardens, Sydney.

area has recently been declared a Marine Park.[40]

There are special and unique features about this region which includes the continental shelf and slopes, and the water which, because of it's different depths, creates an enormous amount of biological diversity. The marine park was established to help conserve marine biodiversity and maintain marine ecosystem processes.

The Broadscale Biodiversity Assessment of the Batemans and Twofold Shelfs identifies a number of other factors as to why this area was accepted as a marine park and why it is of important biodiversity value.

• Listed in the Directory of Important Wetlands.
• The sheltered rocky shores, beaches, reefs, deep-water areas, sand flats and wetlands around the bay provide important habitat for marine life, cetaceans and threatened and migratory birds (ANCA, 1996).
• The endangered hooded plover (*Thinornis rubricollis*) and the vulnerable shy albatross (*Diomedea cauta*), black-browed albatross (*Diomedea melanophrys*), sooty albatross (*Phoebetria fusca*) and pied oystercatcher (*Haematopus longirostris*) have been recorded from Twofold Bay (ANCA, 1996).
• Humpback whales (*Megaptera novaeangliae*) are regularly sighted here when migrating north and south.
• Southern right whales (*Eubalaena australis*) and blue whales (*Balaenoptera musculus*) also visit the bay occasionally as well as other cetaceans including dolphins and pilot whales.
• The bay is a known resting locality for cetacean migrants (ANCA, 1996).
• Species listed under JAMBA or CAMBA and known to occur in the area include the shorttailed shearwater (*Puffinus tenuirostris*), australian reef egret (*Egretta sacra*), white-bellied sea-eagle (*Haliaeetus leucogaster*) and grey plover (*Pluvialis squatarola*) (ANCA, 1996).

Giant Kelp is now only known to extend north to Bermagui as climate change and warming sea temperatures effect it's growth. Within the Kelp are hundreds of organisms that are part of the food chain and the Kelp also provides important habitat to many marine creatures.

> Algal turfs increased in abundance under elevated temperatures, suggesting that future increases in temperature could allow turfs to be increasingly abundant throughout periods of naturally low abundance (i.e. winter). Algal turfs can inhibit kelp recruitment. Any phenological shift that allows turfs to persist though periods of kelp recruitment is likely to reduce the resilience of kelp forests to disturbance.[41]

Posidonia australis is apparently relatively stenohaline and is restricted to areas where average salinities are about 30% or above.

The ocean coast between Twofold Bay and Wonboyn River has the largest area of mapped inshore reef in NSW south of Tuross Heads. There are also small areas of inshore islands and rocks. It also provides the largest area of intertidal rocky shore of all sections in the Batemans Shelf bioregion or the NSW section of the Twofold Shelf bioregion.

The EA states that hot water will be discharged into Twofold Bay and that the temperatures of the coolant will be very high, more than 21 degrees above the ambient water temperature. Temperature is a crucial environmental factor affecting marine organisms and ecosystems. Sea-surface temperature or SST effects every flora and fauna of the sea. Some organisms rely on temperature for breeding cycles, some rely on it for growth. It affects the distribution of populations on both small and large geographical scales, and determines the structure of communities and ecosystems by affecting the physiological processes and

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[40] Breen D.A., Avery, R.P. and Otway N.M., *Broadscale Biodiversity Assessment of Marine Protected Areas in the Batemans Shelf andTwofold Shelf Marine Bioregions* (2005) Final Report, NSW Marine Parks Authority; an ocean embayment is a semi enclosed bay that is a transitional zone between estuaries and the oceans, which provides habitat for communities of both environments.

[41] S. D. Connell and B. D. Russell, 'The Direct Effects of Increasing CO2 and Temperature on Non-calcifying Organisms: Increasing the Potential for Phase Shifts in Kelp Forests' 277 *Proceedings of the Royal Society B* [2010] 1409.

behavior of fish species.[42]

Reefs and marine ecosystems around the world are exposed to the effects of thermal phenomena such as global warming, El Niño and localized thermal pollutants.[43] Heated effluents introduced on the marine environment may cause dramatic and unpredictable effects, depending on the amount and temperature of discharged material, as well as the climatic, hydrological and biological features of the local environment.[44] Fish are mobile, and most could possibly migrate to safe areas when chronic low levels of heat pollution occur. This would depend on the length of the event and the reach of the effluent. However, many of their food sources (i.e. corals, sponges, macroalgae, etc.) are sessile, and may be adversely affected.[45]

Studies show that thermal pollution alters benthic cover and influences fish assemblages by altering composition and decreasing richness. Thermally polluted rocky substrate may be unable to support sessile invertebrates or microalgae vegetation and will have a negative impact on fish using the habitat for shelter, food, nesting and juvenile settlement. Obviously a decrease in habitat complexity can also decrease species richness.[46]

Terrestrial Water Quality

Again the URS SEFE EA makes no mention of the indirect consequences on water supply and quality of the logging of native forest for woodchips.

Currently all unmapped, first and second order streams have less than thirty metre buffers, which suggests that current logging adjacent to these streams is having a significant impact. The CRA report "Water quality and quantity for the UNE, LNE and Southern RFA regions" (1998) Project NA61/ESFM, p 54. went on to say that the methodology used for the EPLs is not scientifically defendable. Even more recent research found in the State of the Forests Report 2008 suggests that twenty metre buffers need to be retained to generally reduce turbidity levels.[47]

Forestry machinery compacts soil, preventing absorption of rainwater. When it rains the run-off carries a lot more sediment into streams. Movement of this machinery and other vehicles along forest roads raises a large volume of dust (30 -90 tonnes per year for every hectare of unsealed road, compared to 0.3 tonnes for unsealed roads in undisturbed forests). Erosion is the largest contributor to turbid water in Australia. A study of the Eurobodalla catchments in NSW showed that approximately 905 tonnes of sediment were transported through the river in one four-day storm. This is compared with thirteen tonnes for the previous six-month period.[48] Significant sediment loads have also been identified as coming from the 50,000 kilometres of unsealed roads within state forests and reserves.[49] Suspended sediment loads in inland waters caused by gully erosion and degraded flow paths, can have significant impacts such as siltation of river channels, infilling of wetlands, reduced light penetration inhibiting photosynthesis, and loss of habitat and spawning sites for gravel-bed dependent fish.[50]

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[42] Glynn P.W., 'El Niño–Southern Oscillation 1982–1983: Near-Shore Population, Community, and Ecosystem Responses' 19 *Annual Review of Ecological Systems* [1988] 309; Wilson J.G., 'Temperature Tolerance of Circatidal Bivalves in Relation to Their Distribution' 6 *Journal of Thermal Biology* [1981] 279; Suresh K., Ahamed M.S., Durairaj G., Nair K.V.K., 'Impact of Power Plant Heated Effluent on the Abundance of Sedentary Organisms, off Kalpakkam, East Coast of India' 268 *Hydrobiologia* [1993] 109.

[43] Forchhammer M.C., Pots E., Kozlov M.V., Hughes L., 'Climatic Signatures in Ecology' 15 *Trends in Ecology and Evolution* [2000] 286.

[44] Lardicci C., Rossi F., Maltagliati F., 'Detection of Thermal Pollution: Variability of Benthic Communities at Two Different Spatial Scales in an Area Influenced by a Coastal Power Station' 38 *Marine Pollution Bulletin* [1999] 296.

[45] T.P. Teixeira, L. M. Neves, F. G. Araújo, 'Effects of a Nuclear Power Plant Thermal Discharge on Habitat Complexity and Fish Community Structure in Ilha Grande Bay, Brazil' *Marine Environmental Research* 68 [2009] 188.

[46] T.P. Teixeira, et al, above n 3.

[47] See *State Of the Forests Report 2008* p109.

[48] Drewry, J. J., Newham, L. T. H., Greene, R. S. B., Jakeman, A. J. and Croke, B. F. W., 'An Approach to Assess and Manage Nutrient Loads in Coastal Catchments of the Eurobodalla Region, NSW, Australia,' (2005), MODSIM 2005 International Congress on Modelling and Simulation, pp. 2658-2664.

[49] Drewry J.J., Newham L.T.H, and Greene R.S.B., 'An Index-Based Modelling Approach to Evaluate Nutrient Loss Risk at Catchment-Scales,' (2008) Integrated Catchment Assessment and Management Centre, The Australian National University, Canberra < http://www.mssanz.org.au/modsim07/papers/43_s47/AnIndex-Baseds47_Drewry_.pdf >

[50] See Monitoring and Evaluation Trials, New South Wales Region, Southern Catchment, Phase 1 Report, (2004) National Land & Water

Water costs have soared since the CRA analysis was done. The price per kilolitre in the Eurobodalla in 2000 was $0.80.[51] It is currently $1.95 per kilolitre and $2.95 for consumption of over one hundred fifty kilolitres. When forests are logged, the amount of water flowing in creeks and rivers, after a short initial increase, can decrease by up to fifty percent. It may even cease to flow in dry periods. Also regrowth needs much more water to grow than mature trees.

In 1999 it was estimated that the cost of water lost by the logging of 2000 hectares of native forests in the Eurobodalla catchments in one year to be over ten million dollars. This amount is compounded each year that these catchment forests continue to be logged.[52] Therefore there is a need to independently reassess the economic costs of the RFAs as they apply to water quantity and security.

The severity of the prolonged drought and inclement climate change conditions is readily portrayed by the flow recordings of all the rivers in the Southern and Eden regions that are victims of the logging of their catchments; the Shoalhaven, Clyde, Tuross, Deua, and Buckenboura rivers in the Eurobodalla shire and Bega rivers. The community's water supply depends upon these rivers. Logging in these catchments is continuing to compound the negative effects of this form of land use on catchment hydrology.

Noise Impacts

Anyone spending time near the Eden chipmill or on Edrom Road knows the amount of noise generated from the mill and trucks. From the two to three bulldozers moving the chip piles, to the log loaders and the chipper, to the huge B-Doubles that come in, sometimes earlier than 5:30 am. The noise that's generated through each town and up and down the highway by the log trucks on the south coast is huge. This is definitely detrimental to tourism.

Flora and Fauna

In the URS SEFE EA there is no mention of effects of the logging of the native forest, that SEFE will use, on threatened and endangered species. This is an incredible oversight.

The numbers of threatened species, threatened populations and ecological communities has increased significantly in the last ten years. The number of threatened and endangered species has risen dramatically on the south coast since the RFAs were signed and many threatened and endangered flora and fauna species are at extreme risk from current logging operations. The Reserve system gazetted to date, along with the off-reserve protection measures of the IFOAs, are neither comprehensive, representative, or adequate to meet the needs of threatened species survival. The Scientific Committee's figure for NSW species, populations or ecological communities threatened with extinction in 2009 is 1035.[53] This figure, when compared to the 1998 figure of 868 is the most indicative of the RFAs effect on our environment.[54]

Resources Audit, < http://lwa.gov.au/files/products/national-land-and-water-resources-audit/er050846/er050846.pdf > and also NSW Diffuse Source Water Strategy, DECC 2009/085, ISBN 978174122 961 5 < http://www.environment.nsw.gov.au/resources/water/09085dswp.pdf >

[51] Water Use and Allocation in the Eurobodalla <http://www.esc.nsw.gov.au/site/plans/Documents/Archive/1999/SOE/SOERd/TheReport/Eurobodalla/IndicatorResults/WaterDemandManagement.htm >.

[52] Atech Group, 'Southern Forests Catchment Values and Threats' (1999) < http://www.atechgroup.com.au >.

[53] For 2008 figures see < http://www.threatenedspecies.environment.nsw.gov.au/index.aspx >.

[54] For 2000 and 2003 figures See < http://www.environment.nsw.gov.au/soe/soe2003/chapter6/chp_6.3.htm#6.3.69 > and for 2006 figures <http://www.environment.nsw.gov.au/soe/soe2006/chapter6/chp_6.3.htm#6.3.71 >; see <http://www.threatenedspecies.environment.nsw.gov.au/index.aspx >; two examples illustrate this point: firstly, in relation to the endangered Hasting River Mouse, the conditions contained in the Integrated Forestry Operations Approval for this species have recently been weakened for certain core areas for the Hasting River Mouse at the behest of the Forests NSW to increase access for logging; secondly, in relation to the endangered Spotted-tailed Quoll, FNSW were found illegally logging a Spotted-tailed Quoll exclusion zone in Forestland State Forest in Upper and Lower North East NSW; they admitted the fact, but claimed it was a 'mistake'; recently in Mumbulla cpt 2135 FNSW failed to notice a koala record and therefore started logging.

Status	2000	2003	2006
Extinct	77	79	75
Endangered	379	396	441
Vulnerable	367	386	392
Populations	17	28	36

A new report by Professor Richard Kingsford, Professor Brendan Mackey and a think tank of thirteen eminent scientists has stated:

> Loss and degradation of habitat is the largest single threat to land species, including 80 percent of threatened species.[55]

As we can see the greatest threats to Australia's biodiversity are caused by broad-scale land clearing and forestry operations including establishment of plantations and fire management practices.[56] The Expert Panel stressed that the persistence and perpetuation of hollow bearing trees is imperative for the survival of forest fauna.[57] A discussion of the conservation measures in place to maintain these hollow bearing trees highlighted the following points:

- Tree mortality is high; the ratio of one recruit tree to one hollow bearing tree is unlikely to maintain the targeted number of hollow bearing trees in Net Harvest Areas in the mid to long term. This is particularly the case in the regrowth zones. Modelling is required to define a more appropriate ratio of recruits to hollow bearing trees.
- The rotation time between harvesting events within a compartment requires revision. Current rotation intervals are too short to allow recruitment trees to form hollows. Additionally, hollow bearing trees retained from the previous harvesting event are not permanently marked therefore could be removed in the next rotation.
- Guidelines or criteria should be developed for the selection of recruitment and hollow bearing trees. Trees with the potential to develop a broad range of hollow types should be targeted for selection. Suppressed trees should not be selected as recruit trees.
- Prescriptions for the retention and recruitment of hollow bearing trees in the Net Harvest Area should be rewritten to emphasise not only maintaining these features during a single cutting cycle but managing them to persist in the landscape.
- Specific prescriptions should be developed for hotspots, defined as areas of high species richness. A sliding scale, where incremental increases in species diversity are matched by increases in prescription strength, was suggested.

SEFR's observations, from on-ground monitoring ten years later, see little change to the prescriptions; the habitat to recruitment ratio is still one to one; the regrowth zone is weaker, because only the hollow-bearing trees present (up to a maximum of ten per two hectares) are retained - if ten are not present then consequently less recruitment trees are retained; there are no stipulations in any harvest plans to retain previously retained trees and rotation times have shortened. For example compartment 62 of South Brooman State Forest has had 'Timber Stand Improvement' twice and been logged nine times since 1954, which is virtually every six years.[58]

Habitat and recruitment tree selection is getting more parlous by the year. Many suppressed recruitment and very small habitat trees (often with no visible hollows) are always found when auditing logged areas, though strangely the stumps are invariably of the largest size class. The sliding scale idea was put in place in Eden yet the solid data on exact amounts of each habitat class that has been logged since 1999 seems

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[55] Kingsford R. T., Watson J. E. M., Lundquist C. J., Venter O., Hughes L., Johnston E.L., Therton J.A., Gawel M., Keith D.A., Mackey B.G., Morley C., Possingham H.P., Raynor B., Recher H.F., and Wilson K.A., 'Major Conservation Policy Issues for Biodiversity in Oceania (p 834-840) Published Online: Jul 13 2009 5:36PM .
< http://www3.interscience.wiley.com/journal/118487636/home?CRETRY=1&SRETRY=0 >.

[56] See The National Strategy for the Conservation of Australia's Biological Diversity (1996).

[57] See 'Review of Protective Measures and Protective Measures and Forest Practices - Biodiversity Workshop Southern Region' Ecologically Sustainable Forest Management Group, July 1999, Project No. NA45/ESFM p176-177.

[58] Southern Region – Compartment 62, South Brooman State Forest, Bateman's Bay Management Area, Harvest Plan approved 8/5/09.

non-existent and the volume of "high" class habitat is not reported on.

FNSW have been informed on the extent of threatened species in their region yet could only find fifteen percent of these species in the Eden region and thirteen percent in the Lower North East in the pre-harvest fauna surveys.[59]

To obtain data for surveys FNSW officers conduct 'nocturnal surveys.' SFOs have often been observed shining their torch on the ground. A case in point is three years prior to logging Compartment 3046 FNSW conducted a nocturnal call playback and spotlight survey and South East Forest Rescue observed the following breaches and inadequacies during this survey.

> 8.8.5 Nocturnal Call Playback
> Nocturnal call playback must target the following species: Masked Owl, Sooty Owl, Barking Owl, Powerful Owl, Squirrel Glider and Yellow-bellied Glider. Nocturnal call playback surveys must be conducted as follows:
> c) At each call playback site, an initial listening period of 10 minutes should be undertaken, then each target species call must be played for five minutes followed by at least a two minute listening period. After the last call at least 10 minutes must be spent listening. Calls must be played from a good quality portable tape cassette or CD player and amplified through a nine volt megaphone, or equivalent or better.[60]
>
> SEFR met the SFOs at 6.30pm on the Tilba-Punkalla Rd and after introductions drove a few hundred metres to the call playback site. There were to be calls from the following species: Koala, Masked Owl, Sooty Owl, Barking Owl, Powerful Owl and Yellow-bellied Glider. The time required for this at seven minutes per species (five minute playback and two minute listen) is forty two minutes. On top of this is the initial ten minute listening period and a final ten minute listening period. This makes the total time for the playback survey to be sixty two minutes. The time was 6.45 when the equipment was set up and SEFR were given instructions on what to do. It was 7.30pm when the parties got back into the cars to drive to the spotlight survey area.
> The total time for the call playback was forty five minutes, which is in breach of the above condition.
> Also of concern is the position and timing of the call playback. The Tilba-Punkalla Rd is a back road to Narooma and the access to many properties. A motorbike drove along the road about ten minutes before the start of the survey and a car came past during the second call. To do this survey at this time, at that position, with this level of disturbance seems that the survey was set up to fail from the start. This also needs investigation as it is not in the spirit of the IFOA.
> The sound from the amplification gear was very distorted and several of the calls were not representative of the species in question, whether that was from the bad sound quality or bad taping of the call is unclear.
> Condition g) states:
>
> Survey season:anytime of the year, preferably in Spring, Summer and Autumn.
>
> While this condition says "preferably" the SFOs told SEFR that they had to wait until spring to undertake some frog and bat surveys.
> These breaches undermine the limited scope for protection of threatened species by the IFOA.[61]

This survey stood as the data on threatened species for that compartment's logging operations three years later.

The lack of care for threatened and endangered species is nowhere more apparent than in the ESFM report which states:

> Any change to the number of species recorded on the estate are likely to reflect research and survey effort rather than true species richness of forest areas.[62]

Scientists advocate an approach based on maintaining ecosystem structure and function, and therefore ultimately protecting more species.[63] Protecting key functional species and diversity within functional

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[59] NSW Government 2006 ESFM "Criteria and Indicators Monitoring Report- 2001/2002: Upper North East, Lower North East and Eden Regions." A Supplementary Report to the NSW Forest Agreements Implementation Report, Forestry and Rural industry Policy, NSW Dept of Natural Resources, Parramatta, p25.

[60] Southern Region IFOA Threatened Species Licence, Appendix B cl 8.8.5.

[61] Letter from SEFR to Doug Mills N.P.W.S. Southern Directorate, Threatened Species Unit, 23/8/04.

[62] NSW Government 2006, ESFM "Criteria and Indicators monitoring Report- 2001/2002: Upper North East, Lower North East and Eden Regions," A Supplementary Report to the NSW Forest Agreements Implementation Report, Forestry and Rural industry Policy, NSW Dept of Natural Resources, Parramatta, p37.

[63] McIntyre, S., Barrett, G., Kitching, R. and Recher, H. 1992, 'Species Triage – Seeing Beyond Wounded Rhinos' *Conservation Biology*

groups is a key way to do this thereby enhancing ecosystem resilience, so that they are able to maintain their functions and processes. It is not enough to merely record species, the impact of the logging must be recorded. We note with great concern that species such as Macrozamia communis (Burrawangs), Dicksonia youngiae, and D.antartica(Soft Tree Ferns), Cyathea australis and C.cunninghamii (Rough Tree fern) and Xanthorrhoea (Grass Trees) which are extremely slow growing, most of these plants have been alive long before white settlement. They grow up to one cm of trunk per year, and when young will take up to ten years to start forming a trunk. Research shows that only between two to thirteen percent of Tree Ferns regenerate after logging and never regrow on snig tracks or log dumps. Tree ferns, which play a vital role in maintaining the moisture of the forest floor and providing protection for the growth of other forest plants, are mostly eliminated by logging. [64]

There are no prescriptions for these flora even though they are protected under NSW legislation.

> Unless the probability of detecting a species when it is present is equal to 1, false negative observation errors will occur in species surveys. The probability of detecting the presence of the case study species in any single standard survey based on spot-lighting and call elicitation has been found to be very low (Pr[detection/ presence] □ 0.12–0.45; Wintle et al. in press), making the reliability of absence data a potentially serious form of uncertainty in our case study. Recent studies have demonstrated the negative impact that false-negative observation error may have on species habitat analyses (Tyre et al. 2003), meta-population models (Moilanen 2002) and monitoring studies (MacKenzie et al. 2002).[65]

Greenhouse Gas/Climate Change

Carbon Neutral?

Combustion of biomass results in atmospheric emissions of greenhouse gases and chemically active species in quantities that almost equal those produced by fossil fuel combustion.[66]

The accounting now used in Australia for assessing CO_2 emissions drawn from the *Kyoto Protocol* contains a flaw that severely weakens greenhouse gas reduction goals. CO_2 emissions from chimneys of biomass power stations when 'bioenergy' is used are discounted.[67] This accounting erroneously treats all bioenergy as carbon neutral regardless of the source of the biomass, which causes large differences in net emissions. The clearing of long established native forests to burn wood or to grow energy crops is counted as a 100% reduction in energy emissions, despite causing large releases of carbon and despite international protocols against logging of native forests.[68]

At issue is the methodology that CO_2 released during combustion of biomass equals that taken up during growth and the basing of all GHG calculations on this. Eucalypt forests recovery for removal of CO_2 from the atmosphere can take more than a 100 years.[69] On average the recovery rate is 53 years for 75% carrying capacity and 152 years for 90% carrying capacity.[70] Currently logging rotations are sometimes barely five years.[71] FNSW themselves state:

> Harvesting cycles vary between native forest types with a typical cycle of 5-30 years for native forest.[72]

6(4): 604-606; Walker, B. 1995, 'Conserving biodiversity through ecosystem resilience' 9 *Conservation Biology* (4): 747-752.

[64] Unwin, G.L., and Hunt, M.A., 'Conservation and Management of Soft Tree Fern Dicksonia antarctica in Relation to Commercial Forestry and Horticulture,' (1996) in *Pteridology in Perspective* (Eds J.M. Camus, M. Gibby and R.J. Johns), pp. 125-137, (Royal Botanic Gardens, Kew : London.)

[65] B.A. Wintle, J. Elith and J.M. Potts, 'Fauna Habitat Modelling and Mapping: A Review and Case Study in the Lower Hunter Central Coast Region of NSW' *Austral Ecology* 30 [2005] 719.

[66] Andreae, M.O., 'Biomass Burning: It's History, Use, and Distribution and It's Impact on Environmental Quality and Global Change,' in Levine, J.S. Ed.., *Global Biomass Burning*, (1991), MIT Press, Cambridge, MA, pp. 3–21.

[67] *Kyoto Protocol* Article 3 (7).

[68] Mackey et al, above n 7: 'For every hectare of natural forest that is logged or degraded, there is a net loss of carbon from the terrestrial carbon reservoir and a net increase of carbon in the atmospheric carbon reservoir, the resulting increase in atmospheric carbon dioxide exacerbates climate change.'

[69] Roxburgh S.H., Wood S.W., Mackey B.G., Woldendorp G., and Gibbons P., 'Assessing the Carbon Sequestration Potential of Managed Forests: a Case Study from Temperate Australia,' 43 *Journal of Applied Ecology* [2006] 1149.

[70] Dean C., Roxburgh S., Mackey B., 'Growth Modelling of Eucalyptus regnans for Carbon Accounting at Landscape Scale' in Amaro A., Reed D., and Soares P., (eds.) *Modelling Forest Systems*, CAB International 2003.

[71] For example Compartment 62 (Sth Brooman) logged in 1972, 1973, 1978, 1982, 1990, 2002, 2009.

[72] Forests NSW Consolidated Annual Financial Report, Year ended 30 June 2007, pp18-19.

As occular evidence suggests, currently on the ground, the native forests logged are not regrowing nor are they being replanted. If the forest regrew and was not logged with such frequency then this theory might hold, and perhaps holds in EU countries where this system was developed, and where the main source of wood is from plantations.[73] The data we have received was cursory to say the least, and even what little forest has been surveyed does not equal one hundred percent regenerated. From the period 2001 to 2006 the number of surveys for the Southern region was twenty one, covering a total of 2,176 hectares.[74] There is no information provided by FNSW or the RFA regime on the effectiveness of regeneration.

> The vascular floristics about a decade after harvesting operations differed significantly from the floristics of similarly aged forest regenerating after wildfire. In clear-felled areas, weed and sedge species occurred more frequently than on wildfire sites and Acacia dealbata was much more abundant, whereas resprouting shrubs, tree ferns and most ground-fern species were more abundant in wildfire regeneration sites.
> The low survival rate of resprouting species reported in an increasing number of studies suggests that soil disturbance is likely to be a major contributor to differences.[75]

Therefore the assumption that there are near-equilibrium conditions (synchrony) in native forest logged by Forests NSW on the south coast is erroneous.[76] Forests NSW do not replant after logging native forest, have only 23,000 hectares available for sequestration and rarely do regeneration surveys.[77]

> For Forest Land, synchrony is unlikely if significant woody biomass is killed (i.e., losses represent several years of growth and C accumulation), and the net emissions should be reported. Examples include: clearing of native forest.[78]

Also at issue is Forests NSW claim that emissions from actual logging operations is separate and the responsibility of the contractors and therefore FNSW have no liability to count them. South East Fibre Exports claim that the emissions from logging are indirect and they have no liability to count them. The definition of impact and direct and indirect effects of greenhouse gas emissions has been well defined in several jurisdictions of Australian Courts. In the *Nathan Dam* case Black CJ, Ryan and Finn JJ held that 'impact' is not confined to direct effects but includes effects that are or would be a consequence of the action.[79] In both the *Hazlewood* case and the *Anvil Hill* case it was held that the impacts of Scope 1, 2 and 3 emissions must be considered.[80] In *Gray v The Minister* it was held that environmental assessments must also consider the emissions from the use of the product.[81] Of course these findings were made in their particular statutory contexts but:

> Carbon accounts for industrialized forests must include the carbon emissions associated with land use and associated management, transportation and processing activities.[82]

Forests NSW also claim there is a lack of full scientific data on land use change and this makes it difficult to calculate GHG emissions. Although it seems widely acknowledged that Land Use Change and Forestry

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[73] In Germany and throughout most of Europe Foresters are employed to count and measure at dboh every tree in the plot.

[74] Southern IFOA Clause 52 Assessment of Regeneration Report 20/6/07, FNSW Batemans Bay. This 'report' is a thin five line by five column table.

[75] Ough K., 'Regeneration of Wet Forest flora a Decade After Clear-Felling or Wildfire - Is There a Difference?" 49 *Australian Journal of Botany* (5) 645, Full text doi:10.1071/BT99053, < http://www.publish.csiro.au/paper/BT99053.htm

[76] Performance Audit 'Sustaining Native Forest Operations,' Auditor-General's Report, 2009: 'To meet wood supply commitments, the native forest managed by Forests NSW is being cut faster than it is growing back': this statement was made concerning the North Coast RFA areas, FNSW had not provided data on the Southern and Eden areas,"reviews of yield estimates for the southern region, due in 2004 for Eden and 2006 for Tumut and the south coast, have not been completed."

[77] SEFR requested these surveys from FNSW and received a five line five column table that stated there had been four surveys conducted but there was no documentation, pers com to author from Danial Tuan, FNSW Batemans Bay; see the aptly titled Sustain Greenhouse Gas Consultation Paper Submission, Forests NSW, Nick Cameron, 1/5/2008.

[78] 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Vol 4: Agriculture, Forestry and Other Land Use, Chapter 2: Generic Methodologies Applicable to Multiple Land-Use Categories, 2.4; the figures used for boreal forests in the IPCC document are from research published in 1998 which has now been superceded by more current data < www.ipcc-nggip.iges.or.jp.

[79] *Minister for the Environment and Heritage v Queensland Conservation Council Inc* (2004) 134 LGERA 272 at 288; see also *Re Australian Conservation Foundation* [2004] VCAT 2029.

[80] *Australian Conservation Foundation v Minister for Planning* above n32; *Gray v the Minister for Planning* [2006] NSWLEC 720.

[81] Rose A., '*Gray v Minister for Planning*: The Rising Tide of Climate Change Litigation in Australia' 29 *Sydney Law Review* [2007] 725; if calculations were made on the cardboard that is made, used, then thrown away, from the woodchips of native forests, then the totals of GHG calculations would a great deal higher.

[82] Mackey et al, above n7.

accounting is difficult and uncertain, given the great deal of data, including LandSat images and records kept in ArcView, GIS, ESRI and FNSW own office records on past compartments logged, it would seem this argument is alio intuitu.[83] Article 3 of the *Kyoto Protocol* states at (3) that 'The greenhouse gas emissions by sources and removals by sinks associated with those activities shall be reported in a transparent and verifiable manner…'[84]

The total CO_2 emissions caused by native forest logging on the South Coast for 2006/07 have been computed to be over 30 million tonnes.[85] On these figures it is estimated that for every hour of energy generated more than 3570 tonnes of CO_2 would be released.[86] The governmental practice of decrying Indonesia's illegal logging while sanctioning illegal logging in Australia has not gone unnoticed by the rest of the world.[87] Thus it appears to the international community that the governmental sanctioning of native forest logging *endorses* the huge amounts of GHG emissions released.[88]

SEFE allege Biomass fired power systems are considered to be carbon-neutral technology when compared to other systems that burn fossil fuels and have minimal greenhouse gas emissions, but as the woodchipping industry has a high GHG emission output and this power station will emit more GHGs than a coal fired power station, neither the industry nor the power station can be classed as carbon neutral.[89]

Burning any carbon based fuel produces carbon dioxide. That's what burning is, carbon plus oxygen yields heat and CO_2 and pollutants. Woody biomass burning produces more carbon dioxide than burning fossil fuels. No matter how many laws are passed and treaties signed when wood is burned it releases carbon dioxide.

> Biomass burning produces fifty percent more carbon dioxide even than coal because it burns less efficiently.[90]

There is currently discussion amongst the national and international scientific communities that burning wood for biomass is equal to three times as much emissions than coal fired power, others argue that wood and coal are closer to equal in CO_2 production, but there is certainly no fuel worse than wood burning for producing carbon dioxide.

Power generation emits significant amounts of greenhouse gases, mainly CO_2. Sequestering CO_2 from the power plant flue gas can significantly reduce the GHGs from the power plant itself, but this is not the total picture. CO_2 capture and sequestration consumes additional energy, thus lowering the plant's fuel-to-electricity efficiency. To compensate for this, more fossil fuel must be procured and consumed to make up for lost capacity. Taking this into consideration, the global warming potential which is a combination of CO_2, methane (CH_4), and nitrous oxide (N_2O) emissions, and energy balance of the system need to be examined using a life cycle approach. This takes into account the upstream processes which remain

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[83] For example FNSW has logged 182 528 hectares of native forests in the south east alone since 1990; it is possible to compare Google Earth images with past LandSat images.

[84] The introduction of the amendments to the *Lacey Act* in America has already had a significant impact on the import of woodchips in that country, importers are now required to declare species, country of origin, value and volume of the plant or plant products see *Amendments to the Lacey Act from H.R.2419 2008* (US), Sec. 8204, *The Lacey Act*, Chapter 53 of Title 16, United States Code, ss3371 - 3378.

[85] 30 860 523tCO2e; Data is from FNSW Implementation Report 2004/05 and 2006/07, 2006/07 FNSW Harvest Plans; ESRI data; Digwood FOI info 2009; if one was to believe the FNSW data it seems one vehicle uses 110L of fuel per year.

[86] This is more than 6.4 times the amount of CO_2 released from burning coal to produce the same amount of energy.

[87] In 2009 young people from four hundred and fifty nations gathered in Bonn for the UN Talks on Climate Change, their declaration called for an immediate end to deforestation, an end to industrial scale logging in primary forests, the conversion of forests to monoculture tree crops, plantations; and protection of the world's biodiverse forests including primary forests in developed countries (e.g. Australia, Canada and Russia) and tropical forests in developing countries; Australia won the Fossil Award in 2009; see also *Forestry Commission v Daines* 1/12/2009 Denniliquin Local Court where the Magistrate made a clear finding on the evidence that a Part 3A approval under the *Environmental Planning and Assessment Act 1979* (NSW) is required for the Barmah/Millewa logging operation and had not been obtained; he concluded, therefore, that the logging was unlawful, yet Marty Linehan, FNSW Eden office manager, stated that "it didn't matter, it was only local court"9/12/09.

[88] '…the laws of nature that account for the global carbon cycle operate irrespective of political boundaries. Therefore, a unit of carbon emitted due to deforestation and forest degradation in Australia, the United States, Canada or Russia has exactly the same impact on atmospheric greenhouse gas levels as a unit of carbon emitted from deforestation and degradation of forests in Indonesia, Papua New Guinea, the Congo Basin or Brazil,' Mackey et al, above n 7.

[89] In SEFE's original proposal to Bega Valley Shire Council they stated the project would not emit any GHGs.

[90] Dr. Rachel Smolker of U.K. based Biofuelwatch.

constant after CO_2 sequestration as well as the steps required for additional power generation. There is no mention of sequestration of the power stations emissions in the EA.

Biomass is not as homogeneous or as predictable as fossil fuels, and may vary, perhaps due to poor quality control by the fuel supplier, changes in fuel availability (e.g., as sawmills may close) or swapping of fuel sources in response to price variations. Such changes can have an impact on burner operation and the pollution control equipment and may lead to increased emissions.

The EA was required to report on upstream and downstream emissions, and emissions from biomass harvesting and it has not. In assessing greenhouse implications and calculating 'avoided emissions' it should have compared the power station proposal with wind or solar or other MRET approved technologies because it will be competing with these technologies in the market place, not coal fired power, but it did not.

Far from fighting climate change, logging and transporting large amounts of bulk logs across borders up and down the south east of Australia and then burning it will increase carbon discharges more than would have been caused by burning a fossil fuel like coal.

There is much uncertainty on the effects of climate change but one of the certainties is that deforestation is one of the biggest causes.

> The loss of natural forests around the world contributes more to global emissions each year than the transport sector. Curbing deforestation is a highly cost-effective way to reduce emissions; large scale international pilot programmes to explore the best ways to do this could get underway very quickly.[91]

The Stern Review goes on to state in Annex 7f:[92]

> Deforestation is the single largest source of land-use change emissions, responsible for over 8 GtCO2/yr in 2000. Deforestation leads to emissions through the following processes:
> The carbon stored within the trees or vegetation is released into the atmosphere as carbon dioxide, either directly if vegetation is burnt (i.e. slash and burn) or more slowly as the unburned organic matter decays. Between 1850 and 1990, live vegetation is estimated to have seen a net loss of 400 GtCO2 (almost 20% of the total stored in vegetation in 1850).[93] Around 20% of this remains stored in forest products (for example, wood) and slash, but 80% was released into the atmosphere. The removal of vegetation and subsequent change in land-use also disturbs the soil, causing it to release its stored carbon into the atmosphere.[94] Between 1850 and 1990, there was a net release of around 130 GtCO2 from soils.

Indigenous Heritage

The EA only considers the very limited and erroneous 0.9 hectares of area. The consequence of native forest logging for the woodchips which provide the fuel for this project are much more far reaching.

Current methodologies for the integration of cultural heritage values are to be inadequately defined and resourced, and the protection of cultural heritage values is directed primarily through the use of forest management zoning and management prescriptions.

The destruction and ignorance displayed by FNSW and their contractors for the protection of sites of significance during logging is nothing short of wanton. Forests NSW buffer zones on sites of significance are very small at ten metres only. If sites are damaged or destroyed there is no enforcement of s37

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[91] See Stern N., 'The Stern Review on the Economics of Climate Change' < http://webarchive.nationalarchives.gov.uk/+/http:/www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm >.

[92] Ibid; see also Emissions from the Land-use Change and Forestry Sector.

[93] Baumert, Herzog and Pershing, 'Navigating the Numbers: Greenhouse Gas Data and International Climate Policy' Washington, DC: World Resources Institute, 2005; see also Houghton, 'Revised Estimates of the Annual Flux of Carbon to the Atmosphere from Changes in Land Use and Land Management 1850-2000', *Tellus B*, 55 [2003] 378.

[94] Houghton J.T.,'Tropical Deforestation as a Source of Greenhouse Gas Emissions', (2005) in Tropical Deforestation and Climate Change, Moutinho and Schwartzman [eds.]; see also Intergovernmental Panel on Climate Change (2001), 'Climate change 2001: the Scientific Basis, Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change' [Houghton JT, Ding Y, Griggs DJ, et al. (eds.)], Cambridge: Cambridge University Press; see also Food and Agriculture Organization of the United Nations (2005): 'State of the World's Forests', Washington, DC: United Nations.

subsection (1) of the *Forestry and National Park Estate Act 1998* (NSW) that states stop work orders and interim protection orders of the *National Parks and Wildlife Act 1974* (NSW) can be applied.[95] Forests NSW state any destruction was an unfortunate accident.

An article by Ridge and Seiver concerning the Sandon Point Development sums up community feeling on the protection measures of the NPW Act:[96]

> The central fault with the NPWA cultural heritage provisions is that an Aboriginal community cannot prevent an activity that is likely to result in the destruction of their heritage. The agency responsible for administering the NPWA retains all ownership rights, including the right to consent to destruction of their property, Aboriginal heritage. The NPWA does not protect Aboriginal heritage, it merely regulates its destruction.

Therefore the legislation enables the listing of sites but does not protect them.[97] See the Gulaga Mountain blockade as an example.[98]

FNSW are about to log more culturally significant areas of Gulaga Mountain and have started logging Mumbulla Mountain. These mountains were identified as being sacred "From the mountain to the sea." There are dreaming tracks leading up to and away from these mountains. They have no protection.

Indigenous Aboriginal communities on the south coast have unanimously stated that they want to take control of the management of significant sites and places and the flora and fauna of significance to ensure they are protected. These significant things are crucial to the future of Indigenous Aboriginal culture and well-being.

The URS EA makes no mention of the areas of Aboriginal cultural significance.

Traffic and Transport

There are erroneous claims in the URS SEFE EA on truck movements. On occular evidence the first trucks start rolling in before 5:30 am. There have been numerous accidents involving log trucks transporting logs to the chipmill. Recently an accident involved a parked school bus and a rural firefighting ute on a clear stretch of highway. The log truck driver smashed into the ute, which then smashed into the school bus which had stopped tolet children off. This is not an isolated incident.[99] Recently a B-double clipped a 4WD sending the 4WD into another and killing a woman and baby.

General Environmental Risk Analysis

The URS EA makes no mention of cumulative impacts of industrial degradation of native forests for the woodchipping industry and South East Fibre Exports that are exacerbating extinction rates and destroying soil, water, and carbon capacity.

Many studies have shown that microbial biomass in the soil decreases following logging, and that these changes occurred before measurable changes in soil organic matter quantity were found. The decline of microbial C and N following tree removal ranged between twenty seven percent and sixty four percent. When bacterial and fungal biomass were determined separately, it was found that fungal biomass declined more sharply than bacteria. The often rapid decrease in fungal biomass may be explained by a reduction in ectomycorrhizal fungi, which decline sharply once the root system of cut stems can no longer support them.

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[95] *Forestry and National Park Estate Act 1998* (NSW) s37 (2) states: However that does not prevent the making of an order for the purpose of protecting any Aboriginal relic or place.

[96] For an overview see *Minister for Planning v Walker* [2008] NSWCA 224; See Ridge, K. & Seiver, A., 'Carriage: An Elders Journey through the Courts', 10 *Indigenous Law Bulletin* [2005].

[97] For a very comprehensive overview of legislation effect on sites see Aliza Tubman 'Protecting Aboriginal Sacred Sites: the Aftermath of the Hindmarsh Island Dispute,' 19 EPLJ (2) [2002].

[98] Uncle Guboo Ted Thomas, (Aboriginal elder and traditional owner) "Mumbulla Mountain; an Anthropological and Archaeological Investigation" Brian J Egloff, Aboriginal & Historical Resources, NPWS, 1979.

[99] See < http://www.abc.net.au/news/stories/2007/08/15/2005643.htm >.

> Conventional practices in intensive forest use such as short rotations, use of heavy machinery, harrowing and high intensity burning of slash can be viewed as detrimental to soil health. After burning, the organic content of forest soils can be transformed into ash and mineralised nutrients. This may result in an intense pulse of nutrients that can change the soil pH and can easily be leached, leaving a nutrient and humus poor soil, with a significantly different structure from the original condition.[100]

Research by the CSIRO states:

> Timber harvesting and its associated activities cause drastic changes in soil physical structures and hydraulic properties. In situ changes of surface soil hydraulic properties using a newly developed disc permeameter are assessed. Five forest sites, two radiata pine forests near Oberon and three native eucalypt forests near Eden NSW, were investigated for the impact of timber harvesting on soil structure and hydraulic properties. On most sites, there was an increase in soil bulk density and a declining trend in sorptivity and hydraulic conductivity associated with logging. Changes in hydraulic properties suggest that the logging and associated activities had resulted in soil compaction, attributable mainly to redistribution of soil pore sizes and with a decrease mostly in pores greater than 3mm in diameter. This reduction in macroporosity suggests a reduction in aeration and a change of water retention characteristics.[101]

The environmental risks are enormous. The industrial logging practices in Australia's native forests by Forests NSW under the Regional Forest Agreements is unsustainable, economically, culturally and environmentally. Currently on the south coast thousands of hectares of native forests are being clearfelled every year. Forests NSW descriptions for these practices vary from 'Australian Group Selection' to 'Modified Shelter Wood' yet they all amount to clearfelling or patch clearfelling on the ground. Old-growth, rainforest, mature and mixed age forests are being logged at an unsustainable rate.

As was suggested in many projected risk analyses in 1997 the likelihood of native forest as a sustainable product was nil. This has in fact been born out in reality. The continuous over quota logging has resulted in only two to three years of saw logs remaining.

> The remaining multi-age forests resource is coming to an end in the next two to three years.

And:

> Following the next two to three year period where sawmill resource is limited, the plan is to move into 1952 and 1968 fire regrowth and to source sawlogs [from that]. That would get them [local sawmills] through to the end of the RFA period.[102]

In the areas covered by the Eden and Southern RFAs, the annual net areas logged have rapidly increased and yields have fallen. In other words, the industry is having to log ever greater areas to maintain the same levels of production. This is not sustainable. Demonstrably unsustainable timber volumes were committed for twenty years, and these even extend beyond the term of the RFAs. The 'FRAMES' industry modelling system used to derive these volumes substantially over-estimated available timber volumes. Consequently, after just a ten year period of the RFAs, there is a dramatic short-fall in timber.

We maintain that the pretence of implementing Ecologically Sustainable Forest Management has failed, is corrupt, and has not delivered on obligations. These unacceptable outcomes are at the expense of the current and future generations and are to the detriment of our unique flora and fauna.

We determine there is a dis-connect within the RFA regime such that the native forest woodchipping industry has exerted undue influence to ensure desirable outcomes for its shareholders at the expense of the current and future generations of the State. We believe this to be immoral.

The enabler of the woodchipping industry and South East Fibre Exports is Forests NSW. We believe that

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[100] See Green D., McQuillan P., 'The Soil Mites of Warra and Their Recovery Under Modern Forestry Practices,' (2004) < http://www.warra.com/warra/research_projects/research_project_WRA103.html >.

[101] Hung J. (CSIRO, Division of Soils); Lacey S.T. (State Forests of New South Wales); Ryan P.J. (CSIRO, Division of Forestry) 'Impact of Forest Harvesting on the Hydraulic Properties of Surface Soil,' 161 *Soil Science* [1996] (2) 79.

[102] Ian Barnes, FNSW Batemans Bay Regional Manager, The Magnet, Thursday, March 11, 2010.

current Forests NSW management has gone beyond its scope as the public caretaker, has broken it's pact with it's citizens and is needing immediate reform.

Consultation

This of course is completely laughable. The amount of community consultation has been next to nothing. SEFE used the old TCA shopfront in Eden which has had no attendance that we are aware of. Some have tried to visit the shop but it seems not to be open in office hours.

Conclusion

[forests] reduce concentrations of greenhouse gases in the atmosphere…[103]

At the second reading of the Environmental Planning and Assessment Amendment (Infrastructure and Other Planning Reform) Bill when Part 3A of the EPA Act was introduced to parliament, the Minister stated that Part 3A would 'strengthen environmental outcomes' and would provide 'better outcomes for the community and the environment'.[104]

In *Gray v the Minister* it was held that under the *Constitution Act 1902* (NSW) the Minister must act 'for the good management of the public affairs of NSW'. Pain J held that under Part 3A the Minister and the DG must take the public interest into account.[105] This followed *Telstra v Hornsby Shire Council* where it was found that when taking public interest into account the principles of ESD must be considered.[106] The principles of ESD are part of the objects of the *Environment Planning and Assessment Act*.[107]

This ruling stemming from *Gray v the Minister* indicates that the DG's requirements should make mention of ESD principles. The evidence of the threat of serious or irreversible harm to the environment should trigger the precautionary principle. Once triggered the decision maker is required to assume those threats are present.

As there is no mention in the DG's requirements of the precautionary principle, or intergenerational equity, it would seem ESD principles have been given scant regard and, while the Minister does have broad discretionary powers under Part 3A, the legislation requires the decision maker to use their discretion in accordance with the Act.[108]

Climate change and pollution mitigation measures are currently great matters of public interest. Given the evidence on climate change, the adverse impacts of native forest logging's GHG emissions, the effect on water supply, the loss of biological diversity, the loss of ecological integrity and the pollutants wood-fired power stations emit, it would therefore be difficult to argue that this project will have positive environmental outcomes and certainly does not fit the definition of zero emission technologies.

The definition of renewable technologies are that they do not release greenhouse gases and utilise zero carbon resources. As the industrial patch clearfelling of the south east is the antithesis of renewable, to continue to class native forest logging as carbon neutral seems wilfully negligent and transparently disingenuous.[109]

If the alleged premise of the power station is to help the State government meet renewable energy targets

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[103] Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests *The Montréal Process* Third Edition, December 2007 sII (1) < www.rinya.maff.go.jp/mpci/ >.

[104] Tony Kelly, NSW Minister for Rural Affairs, *Hansard, 9 June 2005,* p 16767.

[105] *Gray v the Minister for Planning* [2006] NSWLEC 720.

[106] *Telstra v Hornsby Shire Council* [2006] 146 LGERA 10.

[107] *Environment Planning and Assessment Act 1979* (NSW) s 5 (vii); the definitions are contained within the *Protection of the Environment Administration Act 1991* (NSW).

[108] See *Gray v the Minister* above n 105.

[109] Woolf T. and Biewald B., 'Efficiency Renewables and Gas: Restructuring as if Climate Mattered' 64 *Electricity Journal* January/February[1998].

at least-cost, then as there are only labour and transport costs, the least-cost philosophy has been superficially applied. With closer investigation it seems the subsidisation of the woodchipping industry is the hidden enabler. Without these subsidies electricity generation from biomass is not competitive with other fossil-based power stations because of high capital cost and large logging and transportation emissions.[110]

It appears the NSW government's use of Part 3A is often when there is revenue making opportunities for the government.[111] This then makes it hard to understand why the Minister called this project in considering Forests NSW native forest section lost $16 million dollars last year.[112] Royalties in South East NSW are now less, in real terms than they were fifteen years ago and Forests NSW is making less in royalty revenue than it expends in managing woodchipping operations.

> Given that native forest operations ran at loss of $14.4 million in 2007-08, this raises concerns about how much worse this financial burden may get.[113]

This loss must be compared to the tourism income figures which, on the South Coast in 2009, provided $1.9 billion dollars in revenue.[114]

Australia is only now, slowly, coming in from the cold. After eleven years of ridicule from international quarters the NSW Government has the chance to gain international respect if the right decisions are made. The residents of the South Coast and the environment are, by definition, stakeholders in Forests NSW and SEFE and have an interest in the results of forestry operations. The majority of residents on the South Coast are very concerned about climate change and deforestation.[115] Thus the Part 3A 'better outcome' for communities and the environment would be for the government to cease native forest logging and reject the SEFE woodchip-fed native forest burning power station proposal.

Nullica State Forest where they are required to leave 4 trees per hectare.

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[110] See Santisirisomboon J., Limmeechokchai B., Chungpaibulpatana S., 'Impacts of Biomass Power Generation and CO_2 Taxation on Electricity Generation Expansion Planning and Environmental Emissions' 29 *Energy Policy* [2001] 975; Palmer K., and Burtraw D., Cost-effectiveness of renewable electricity policies' 27 *Energy Economics* [2005] 873; Spinellia R., Ward S. M., Owendec P., 'A Harvest and Transport Cost Model for Eucalyptus spp. Fast-growing Short Rotation Plantations' 33 *Biomass and Bioenergy* [2009] 1265; see also Commission of the European Communities, Brussels, 7.12.2005 COM(2005) 627 Final Communication from the Commission 'The Support of Electricity from Renewable Energy Sources' {SEC(2005) 1571}: this analysis sheds light on international effectiveness of biomass energy < http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexplus!prod!DocNumber&lg=en&type_doc >; FNSW sell logs to SEFE a $6.90/tonne; the NSW and Victorian governments subsidised the Eden chip mill by approximately $8 million in 2006-2007; SEFE made a $9 million profit as declared on their 2006/07 ASIC disclosure.

[111] Farrier D., 'The Limits of Judicial Review: Anvil Hill in the Land and Environment Court' in Bonyhady and Christoff (eds), *Climate Law in Australia,* Federation Press, Sydney (2007).

[112] 'I can only see this loss increasing as Forests NSW continues to look for new sources of hardwood timber and the costs of harvest and haulage increase, this will be very difficult to manage': the Auditor-General, Mr Peter Achterstraat, Media Release: Auditor-General's Report, Sustaining Native Forest Operations, 29/4/2009, < http://www.audit.nsw.gov.au/publications/reports/performance/2009/forests/media_release.pdf >;he was right FNSW native forest section lost 16 million in 2009/2010.

[113] Auditor-General's Report Performance Audit, *Sustaining Native Forest Operations*, Forests NSW (2009).

[114] Employing 58 463 people, a higher than average proportion of the workforce; Tourism NSW, Travel to South Coast NSW region, Year ended March 2009, <http://corporate.tourism.nsw.gov.au/Sites/SiteID6/objLib18/South%20Coast%20NSW%20TOTAL%20REGION%20YE%20Mar%2009.pdf > ; O'Neill J., *Review Into Tourism in NSW: Final Report for the Premier of NSW 2008*, < http://www.atec.net.au/review_into_tourism_in_nsw___john_o_neill_ao.pdf >; this is compared to a total of 266 native forest industry employees (chipmill,sawmill,loggers,jinker drivers) and FNSW $16 million dollars in the red.

[115] Clean Energy for Eternity originated on the South Coast; there are eight active green NGOs and an umbrella NGO; the Green vote rose half a percent last federal election; Euroboalla Shire Council prided itself in the past that it was the last shire left in Australia with over 75% tree coverage; Tourism Australia ran a campaign to promote the Sth Coast as the Wilderness coast but had to pull it.