

## Submission on Emissions Trading Scheme discussion paper

Thank you for again offering the opportunity of input into the climate change review's emissions trading scheme discussion paper. Since the previous submission on Land use- agriculture and forestry, two reports have been released by the NSW Department of Environment and Climate Change that have relevance to issues around the inclusion or otherwise of agriculture and forestry into an ETS. In particular, they highlight the need for management systems and methods with greater certainty and simplicity, likely to greatly assist in measuring and monitoring of carbon stocks and fluxes in vegetation and soils.

The first report is the draft Koala management framework<sup>1</sup> that, consistent with Friends of the Five Forests management and research proposals, recommends the implementation of an 'adaptive management' approach to Koala conservation. Other positive recommendations include maintaining and improving habitat in areas with Koalas (Category A lands) by excluding further logging, burning, new road construction, minimizing disturbance associated with maintenance of existing roads and addressing the other known threats.

Supposedly giving effect to the recommendations are the outcomes of Koala surveys<sup>2</sup> in the Five Forests that have begun to delineate areas in production forests occupied by the few remaining animals.

While on the one hand current legislation will need to be changed to accommodate these 'anomalous' areas and the framework proposes many changes to legislation, the Koala surveys introduce the means to both delineate areas of current Koala use and begin to address the largely neglected issue of forest mensuration. The methodology developed by the consultants (Biolink) termed 'Regularized grid-based Spot Assessment Technique (RGB-SAT), employs what is described as a ' . . . defacto point-based vegetation sample of the tallest and mid stratum communities' at predetermined points from 350 to 500 metres apart.

Despite Australia's role in assisting developing nations to measure and manage forest emissions, there is some concern that without adequate on ground validation, the NCAS may be overly reliant on the interpretation of satellite spectral imagery. There is no doubt that the availability of satellite images has made the development of the NCAS possible and at a local level has also assisted in, among other information, the identification of 'centers of endemism' for dieback associated with dry weather.

However, rather than a technological constraint, confidence in the interpretation of satellite images and even finer scale aerial photography, may best be achieved with adequate on ground validation. It is arguable that the need to find solutions to the vexing questions of measurement of emissions and carbon stocks in forests could

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<sup>1</sup> Eco Logical (Aust). (2006). Draft Far South Coast Koala Management Framework: report to the NSW Department of Environment and Climate Change.

<sup>2</sup> Biolink ecological consultants. (2008). The utility of regularized, grid-based SAT (RGB-SAT) sampling for the purposes of identifying areas being utilized by koalas (*Phascolarctos cinereus*) in the South-east Forests – a Pilot Study: Report to the NSW Department of Environment and Climate Change.

come partially from the knowledge that institutions are fulfilling their legislated obligations and working collaboratively to ensure uncertainties are reduced.

Such collaboration could be anticipated in Tumbarumba where the only forest atmospheric carbon monitoring facility, part of a global network, in the southeast is located and forest inventory was undertaken during the Southern Regional Forest Agreement. Unfortunately there is no evidence to suggest this collaboration or accountability exists and as indicted (below) in the NSW Auditor General's qualified audit of the NSW Forestry Commission's Biological assets, for the year ended 30 June 2007, the necessary work to provide any confidence has not been undertaken.

The audit of the Commission's financial report for the year ended 30 June 2007 resulted in a qualified Independent Auditor's Report in relation to the valuation of Biological Assets. There are significant assumptions and uncertainties in the valuation of Native Forest Timber. The Commission was unable to provide all the information that was required to confirm the valuation. This, together with the Commission's ongoing intention to apply a new inventory regime, meant that we were unable to form an opinion on the value of the Native Forest Timber included within Biological Assets. Consequently we were unable to quantify the possible adjustments to the financial report that might have been necessary had this limitation not existed.

The Regional Forests Agreements are underpinned by the Forest Resource and Management Evaluation System (FRAMES), a forest inventory system that provides information about the timber available to be harvested. In carrying out our review of the data used by the Commission for the valuation of Native Forests we noted the following areas of non compliance with the regional forest agreement milestones:

f monitor FRAMES performance by comparing actual and predicted volume each 12 month period this was not done by the Commission

f undertake additional inventory plot measurements inventory plot measurements that are used for the forest valuation were last updated in 1999, except for North Coast region which was updated in 2003. The Commission advised updated inventory has been carried out but is still being validated

f undertake independent audits of sustainable yield to be completed and published in time for each subsequent five year review (due 30 April 2007) no audit of sustainability has been performed for the five years to 30 April 2007.

Clearly while any apparent collaborative effort between institutions at a national/state or regional scale is yet to manifest itself and until policy makers change current legislation to enable 'carbon conscious' catchment management options, an unacceptable level of uncertainty will remain.

The Eden region was 'first cab off the rank' for the NSW Regional Forest Agreement process and the concerns about the lack of adequate forest inventory are detailed in the consultant's report <sup>3</sup>, official report and the dissenting final report produced by conservation representatives, including myself, on the FRAMES committee.

These concerns, especially the requirement for adequate data on tree species and diameter distributions, formed the basis for the development of the inventory

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<sup>3</sup> Forest Essentials Pty Ltd. (1997): *Validation of Eden Wood Resources Data*. A report undertaken for the NSW CRA/RFA Steering Committee: Resource and Conservation Division, Department of Urban Affairs and Planning, GPO Box 3927, Sydney, NSW 2001.

methodology for the rest of NSW by the FRAMES committee. The RGB-SAT surveys represent the first introduction in the Eden area of similarly grid based means of attaining unbiased forest inventory data, integrated with Koala research and at a much finer scale than the FRAMES inventory.

We agree there is considerable scope for management options to increase the potential for sequestering carbon through changes in forest and agricultural management practices, but confidence, particularly with regard to forests, requires that the necessary baseline data be collected. In common with FOFFs proposals the Koala management framework proposes a number of locations as the focus for recovery actions. Such an approach, given inventory data over broader catchment areas, provides the opportunity to greatly reduce costs by focussing research on flora, fauna, soils and the weather at appropriate, representative locations.

As previously indicated FOFFs proposals include exploring the potential for using local biomass, from silvicultural and fire hazard reduction activities undertaken on public and private land, to generate 'green electricity' and return the resultant soil conditioning product from whence it came.

This year (2008) public forest management agencies in the south east have announced proposals to undertake fuel reduction burns across some 90,000ha. of native forest. Reasons put forward for this management include assumptions that controlling wildfire and asset protection will be more possible, certain 'forest/vegetation types' require burning at prescribed intervals and post logging burns provide a seedbed suitable for tree recruitment.

The volume of biomass consumed in these burns varies depending on the source of the information. The general rule of thumb provides for around 100 t/ha of biomass or half the removed volume, for post logging burns down to around 20 t/ha for prescribed fuel reduction burns, arguably the volume required to initiate soil formation processes.

However, measurements of forest carbon<sup>4</sup> found mean volumes of 10.4 t/ha for fine litter and 49.4 t/ha for coarse wooden debris in coastal forests. If it is assumed that 15,000 ha or 17% of areas to be burned are post logging coupes and burning 'patchiness' consumes only 50% of forest floor biomass, based on the aforementioned measurements, fuel reduction burning across 75,000 ha alone potentially consumes over 2 million tonne of carbon per annum.

In addition, fuel reduction burning has been estimated to require 1.31 litres of fossil fuel per hectare treated, about 118,000 litres for this year's 90,000 ha. burning program. Should the NSW Government implement the recommendations of the Koala management framework and more broadly FOFFs proposals, emissions from and associated with deliberate burning will largely be eliminated.

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<sup>4</sup> Roxburgh, S. Wood, B. Mackey, G. Woldendorp and P. Gibbons (2006) Assessing the carbon sequestration potential of managed forests: a case study from temperate Australia. *Journal of Applied Ecology* 43, 1149–1159

Results from the trial RGB-SAT survey again raise concerns about the accuracy of the vegetation mapping developed for the Eden RFA area, with regard to the distribution of eucalyptus species. This inaccuracy in the vegetation models again confirms the poor information base on which important land management decisions have been made. Also, that after logging the same forest does not generally grow back, but is replaced by more fire sensitive eucalypt and non-eucalypt species that are not preferred by Koalas.

FOFFs proposals to exclude deliberate burning, in favor of adapting management to new technology, go beyond current regulatory requirements to abate emissions. Although whether our management proposals would be economical without the benefit of income from offset credits remains to be adequately assessed.

Some certainty about economic viability may stem from establishing a price for carbon and a point of obligation for forestry and agricultural emissions, in order that comparisons with current and proposed alternative management regimes may be made.

For example, information in the following table comes from Harvesting Plan estimates and answers to questions in the NSW Parliament about revenue from contentious logging operations undertaken last year in the northern part of FOFFs area proposed for adaptive management (Compartment 3046, Bodalla SF). Part of the compartment was not logged as the area is subject to BMAD and was deemed 'non-commercial'.

Product	Estimated volume (m <sup>3</sup> )	Revenue	Unit (m <sup>3</sup> ) Royalty
HQ sawlogs	3,100	\$275,428	\$88.85
Salvage sawlogs	1,500	\$11,909	\$7.94
Pulplogs	1,500	\$11,623	\$7.75

On the assumption that the estimated volumes reflect harvested volumes, the royalty rates for salvage and pulplogs, the latter determined by distance from the chipmill, seem very low relative to high quality sawlogs. The other option could be that a proportion of salvage logs were found to be of higher quality than estimated, which would increase the volume of the more profitable product. At this point however, an apparent contradiction becomes evident when consideration is given to the following quotation from Forests NSW.

“ . . . Recent data collected by State Forests of New SouthWales (F. Ximines, personal communication) showed that in a sample of 527 trees destructively harvested from within the study area, those with a d.b.h. above approximately 50 cm begin to show signs of internal decomposition, and at approximately 120 cm d.b.h. actual tree mass is approximately 50% of that predicted by the allometric equations. The following adjustment to the predicted biomass from the Ash & Helman (1990) allometric equations was therefore made:” (Roxsburgh et al, 2006)

On the basis of the communication, the adjustments made to the equations reduced estimates of carbon in trees greater than 145 cm DBH, although signs of internal decomposition in trees of 50cm DBH, when high quality large sawlogs are generally

considered to be solid stems of a least 70cm DBH, may reflect more fundamental problems related to reducing forest carbon sequestration potential.

Locally, this information is supported with an observed increase in the number of large live trees falling with and apparently resulting from, internal decomposition and root rot and the spread of BMAD. FOFF propose that a proportion of these fallen trees be considered for larger sawn timber production, using small-scale transportable mills. This approach could provide greater certainty about the volume of carbon likely to be sequestered in long lived timer products.

Only a small proportion of timber products from native forest logging operations is sequestered in long-lived timber products. Most timber removed supplies the million tonnes of native forest hardwood woodchips exported per annum from Eden. The length of sequestration time for the half million tonnes of carbon in these woodchips is not quite as short as burned biomass, but negative impacts will increase if paper products end in landfill.

As indicated in FOFFs management and research proposals, where economically, environmentally and socially feasible, the management of all biomass is to be considered and tested for integration into a sustainable and 'carbon neutral' approach to natural resource management.

Lastly is the issue of carbon in soils and particularly addressing the area of 'non-productive' forest and emissions from exposed soils resulting from logging, burning, road construction and maintenance. Soil carbon stocks for broad soil carbon units in the south east corner<sup>5</sup> range from 56 to 161 tonnes of carbon per hectare in the top (30 cm) layer, where such a layer can be found.

Despite the recommendations of the Koala management framework and the appointment of a Koala recovery officer, the first management action undertaken by FNSW in Category A Koala habitat was road 'maintenance' with maximum disturbance. This involved not only grading of the road surface and beyond, but also clearing of all vegetation and 'topsoil' for 4 metres either side of the roads. In locations where drainage runoffs are opposite one another, generally in dips along ridges immediately above watercourses, the width of exposed and disturbed soil is up to 25 metres across.

The two roads total about 7 kilometres in length and at an average of 15 metres across gives a total area of 10.5 hectares, that once would have probably retained over a thousand tonnes of carbon in the soil and a capacity, now lost, to sequester carbon in vegetation. While this example represents a small area, all of the hundreds of kilometers of forestry roads are maintained either in the same manner or with a bulldozer. Clearly, emissions from fossil fuel use and clearing would be reduced if the recommendations about minimizing disturbance were implemented, particularly given that after road construction, road maintenance is understood to require more fuel (120 litres per kilometer) than any other forest management activity.

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<sup>5</sup> Webb, Adrian. (2005) Pre-clearing soil carbon levels in Australia. *Environment Australia Cataloguing-in-Publication* (National Carbon Accounting System technical report; no.12)

Unfortunately, the evidence indicates that the negative impacts of this management extend beyond the area of obvious disturbance. Many of the gullies in the short steep catchments below these roads in Wapengo catchment are subject to Bell-Miner Associated Dieback (BMAD). As well as reducing carbon sequestration potential, BMAD has recently been determined by the NSW Scientific Committee to be a key threatening process, likely to have a negative impact on many native species including Koalas.

The enduring nature of institutional behavior seems to ensure sub optimal resource allocation and their low commitment to reduce emissions is difficult to describe as anything but a deadweight loss to the environment, the economy and society.

We agree with the Garnaut secretariat that “ . . . *The design of the ETS will need to consider how to avoid disadvantaging landowners or farmers in agriculture and forestry sub-sectors who choose to take positive action to reduce emissions.*” However, if positive environmental, social and economic outcomes are the aim, it is clear that the design of an ETS that includes agriculture and forestry, will also need to account for those who cannot demonstrate they are taking positive action.

It does seem likely that initially the inclusion of agriculture and forestry into an ETS could be achieved with general ‘rules of thumb’. Also that the current utility of the NCAS for general use may be low and the models therein may not have the necessary flexibility to accommodate local variations to tree recruitment, growth and mortality outside the general ‘rule of thumb’.

Hence, FOFFs proposals are aimed at a bio-regionally relevant and practical ‘whole of catchment’ approach to management and carbon modeling that, with the commitment of policy makers, becomes ‘normal’ local management practice. In that context, adaptive forest and catchment management ‘options’, also provide the opportunity to test currently untested forest restoration and Koala recovery theories.

Changes to management clearly open the opportunity to achieve small but in terms of maintaining local biodiversity, critical early emission reductions, depending on what emissions are counted and the level of urgency associated with reducing all GHG emissions. We believe that in conjunction with other initiatives, extending the RGB-SAT surveys across the Five Forests, in addition to aerial images, would greatly increase confidence in the measuring and monitoring of carbon for forests, should they be included in an ETS.

We look forward to recommendations from the Garnaut review encouraging Governments to commit to regionally relevant management, so forest sink capacity, biodiversity and the natural capital of local communities is maintained and improved and emissions are reduced.

Yours truly,

Robert Bertram  
Bermagui  
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