RESOURCE INFORMATION Letter & Reply CSER&C (i)resource withdrawal alter (Q newly poposed national parts (2) Reply - note 11.3% sawlog resource withdrawal is only for until end of 1st cutting cycle (v 1994) -1991 EIS implies a total of 10% loss of resource for 1st & 2nd cutting (y cles Pulpwood availability from overseas 3 plantations. Plantation strategy summay -[4 Studies Recover of smallwood for pulp 5) Commissioned to Regional Value adding (6) Consulfative Commi HPE / lomm State Agr



CONSERVATION COUNCIL OF THE SOUTH-EAST REGION & CANBERRA (Inc.)

GPO Box 1875 Canberra ACT 2601 AUSTRALIA

Kingsley Street, Acton Tel: (06) 2477808 Fax: (06) 2485343

P.2/22

The Hon. Gary West, Minister for Natural Resources, NSW Government, Parliament House, Sydney 2000

Mon, 22 Oct 1990

Dear Minister,

We are writing to request clarification, as a matter of urgency, on the following points relating to the recent joint NSW/Federal announcement regarding the south east forests:

1/ 'RESOURCE WITHDRAWAL'

The Prime Minister's statement on 8.10.90 claimed that "the new reserves will withdraw about 11.5% of the timber resource currently available to the industry". At the same Press conference, Mr Greiner' statement said that "11.3% of the region's sawlog resource will be preserved".

We would like to know the referent for the percentages cited in each case. For instance, does the overall figure (ie the 100%) refer to the Eden Native Forest Management Area? If so, are regrowth forests included or excluded? Do the figures refer to the second 'cutting cycle' only - or to the aggregate of both first and second cutting cycles?

You will appreciate that it is impossible to evaluate claims which are currently being made, by the National Association of Forest Industries and others, that extensive job losses will result from the decision, unless these 'resource withdrawal' figures are clarified. This is of considerable importance, especially because as far as we are aware neither the NSW or Federal governments have refuted NAFI's claims to date.

2/ 'SPECIAL PRESCRIPTION AREAS'

We understand that maps of new proposed reserve boundaries in the south east currently in circulation indicate an intention that certain areas, outside the new reserves, will be managed as 'special prescription areas'. For instance, we notice that these maps refer to a proposed 'Cathcart Special Prescription Area' and 'Nalbaugh Special Prescription Area'. We would like more information about the intended management prescriptions within such areas.' Is it intended, for instance, that only light selective logging will be permitted in these areas? Will the special management prescriptions be subject to Commonwealth approval?

3/ FIELD STUDIES COMMISSIONED BY THE ISC

In a letter to Ms Penny Laver dated 24.9.90, you stated that "field studies of plants and vertebrate animals were undertaken in a large part of the National Estate areas". It is clear from the context in your letter that you were referring to new studies commissioned by the Joint Scientific Committee.

As far as we can tell, the results of these studies were not cited in the JSC report itself. Similarly, it does not appear that these studies have yet been published. We would be grateful if you could supply us with copies of the field studies commissioned by the JSC to which you referred in your letter with Ms Laver.

We look forward to your reply with interest,

Yours sincerely,

Sid Walker Forest Campaign Worker

Tel. Aebil.

Peter Herbst Convener, Forestry Working Group Page 2



MINISTER FOR TOURISM MINISTER FOR LANDS AND FORESTS

16 NOV 1990

F.3799 6090

Mr Peter Herbst Convenor, Forestry Working Group Conservation Council of the South-East & Canberra (Inc) GPO Box 1875 <u>Canberra</u>. ACT 2601

Dear Mr Herbst,

Thank you for your letter of 22 October 1990, concerning the joint NSW/Federal announcement on the south east forests.

The 11.3% of sawlog resource announced in Mr Greiner's statement referred to the total sawlog resource estimated to be available in the reminader of the first cutting cycle, as last calculated at 1.1.1990. This figure will be refined as the reserve boundaries are delineated more precisely and account taken of logging in 1990 up to the date of the decision. Furthermore, the effect of this reduction on the sustained yield level must be calculated. It will be quite evident to you, of course, that the transfer of a sizeable area of productive forest to National Park status must have an effect on the long term sustainable productivity of the Eden Management Area.

Management guidelines for the special prescription areas, including details related to the intensity of harvesting are currently a matter for discussion between the Forestry Commission and the National Parks and Wildlife Service. Some special prescriptions will be based on the recommendations of the Joint Scientific Committee report.

The field studies commissioned by the Joint Scientific Committee are described in Section 3.5, pages 91-95 and further discussed on pages 135-144. Specific comments on rare species and unusual communities occur in Chapter 6. Table 3.2 on page 92 lists the individual studies covering some 32 000 ha and notes that some of the studies have been published while others are still in preparation for publication. The report states that all data was included in the analyses.

Yours sincerely, igro

WEST, M.P.

INISTER FOR TOURISM, LANDS AND FORESTS

Level 12, First Chicago House, 33 Pitt Street, Sydney Australia, 2000 Telephone: (02) 251 8498 Facsimile: (02) 251 1442

GARRY



Margules & Partners Pty. Ltd.

45 Jardine Street Kingston ACT PO Box 362 Kingston 2604 (062) 95 7375

Byron Bay Office (066) 84 7451

30 January 1987

The Secretary Department of Arts Heritage & Environment P O Box 1252 CANBERRA ACT 2601

ATTENTION: Mr P Herbert

Dear Sir,

Please find enclosed the additional information you requested in your letter of 7 January 1987.

To date I have provided a response to points A - C and half of the information requested in point D. The remaining information will provided in due course.

Should you have any further queries please contact me.

Yours faithfully, Ansonsa

D Parsonson.

SAWLOG AVAILABILITY POST 2013

As discussed in the Final EIS, sawlog availability beyond 2013 has not been subjected to detailed analysis by the FCNSW.

In response to your Department's request for additional information we sought advice from the FCNSW has provided the following information while reiterating its concern that the information provided should be considered as an order of magnitude estimate only. More detailed assessments of future resources will be conducted later in the rotation.

In addition the FCNSW stressed that the estimates are conservative reflecting the length of time between now and 2013 and the uncertainties inherent in such a long time period.

Sources and Volumes

The FCNSW anticipate being able to supply at least 40 000m³/annum during the period 2010-2020. This is made up as follows.

	Volume (m ³)	Source	
	150 000	Mature wood left at 2010	
	92 000	To be thinned from coastal forests in the Bega district amounting to $4m^3$ /ha from 23 000ha	
	100 000	Thinned from logging regeneration and retained sawlogs $2m^3/ha \ge 50\ 000ha$ (greater than 30 years old at the start of the period). (Refer to page 124 SDDEIS for indication of retained stem basal areas)	
	40 000	Thinning 10 000ha of 1939 and 1952 regeneration at 4m ³ /ha. (Refer Table 5.2 page 5.6 of the figures from an actual thinning operation)	
	~40 000	Sawmills typically draw on average 95% of quota. On this basis some 3000m ³ /annum would be available which over the 23 years would equal ~69 000m ³ . Allowing for some variability over this period say 40 000m ³ would not be taken up.	
Total	422 000		

Hence for the 10 year period an annual cut of 40 000 is considered feasible.

Environmental Impacts

Trees are retained on harvested lands to fulfil a number of requirements. the criteria used to select trees for each purpose are aimed at finding trees for that purpose. This is particularly the case for habitat trees which are selected for their suitability for arboreal wildlife. The presence of hollows is an important criterion in the selection of these trees (page 4.38 DEIS).

The presence of holes in these trees is likely to make them unsuitable for sawmilling because they indicate of significant internal decay.

Other retained stems, including future sawlog trees and seed trees will be suitable for sawmilling during this subsequent harvest. Removal of these trees should not have significant environmental impacts on wildlife. Future sawlog trees in particular are selected for good form and general health and vigour, as such they would be unlikely to provide suitable nesting holes within the time frame involved.

The FCNSW has indicated it will undertake routine reviews of wildlife habitat tree requirements on logged coupes during each subsequent harvesting operation with a view to retaining additional trees to replace any habitat trees which may have been lost during the intervening period. This will ensure continued retention of suitable trees for this purpose.

Possible extent of Sawlog-only Operations

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in the "Coolangubra" and "Tantawangalo" Areas

For the purpose of this exercise the two areas mentioned are assumed to be the areas listed on the interim list of the Register of the National Estate.

The FCNSW has provided an assessment of the portion of these areas it considers could be logged under a sawlog-only regime. These portions, and the resulting implications for yields of sawlogs and pulpwood, are provided in the following table.

Area	Operation Type	Approximate Gross Area of Forest to be Harvested (ha)	Net Sawlog Yield (000's m ³)	Net Pulpwood Yield (000's tonnes)
Tantawangalo	Integrated	10 000	249	1190
	Sawlog only (with head butt)	8 000	204	245
Coolangubra	Integrated	35 000	323	2650
	Sawlog only (with head butt)	11-12 000	135	166

Sawlog volumes are reduced for two reasons. Firstly large areas become uneconomic to harvest because of the low volume of sawlogs per unit area.

This is particularly the case with Coolangubra where more than half the area is considered uneconomic to harvest for sawlogs-only. No detailed map of areas which are considered uneconomic has been provided by the FCNSW. From information provided the more eastern, drier forests in the Pericoe and Big Jack sections would be the main areas of uneconomic forests.

The second cause for a drop in sawlog volumes comes from a reduction of around $5m^3/ha$ in areas that are harvested. (This applies in particular to Tantawangalo.) This drop arises because the harvesting crews are less inclined to fall doubtful sawlog trees which would otherwise be cut as a matter of course in integrated

operations. Crews receive no payment for the falling component if the tree has no sawlog value.

The impacts, both positive and negative, of the change from integrated harvesting to sawlog-only operations are discussed below.

Areas Excluded from Harvesting

The most significant impact would be that 20-25 000ha of forest would be excluded from harvesting. The criterion used to exclude these areas would be the economic feasibility of mounting a sawlog-only harvesting operation. The areas excluded would typically be the drier, lower site quality forests with a large proportion being the dry sclerophyll type.

While there would be large areas excluded from harvesting, the exclusions would not be made to achieve particular objectives of management, e.g. to improve the conservation status of certain species or communities, to reduce the visual impact of operations or to improve catchment protection.

Clearly while some of these objectives may be met it would be unlikely that the benefits to be gained by foregoing the the volumes of wood involved would be optimised by this approach. In fact a decision to exclude areas on the basis of low productivity would significantly reduce the FCNSW's capacity to reserve additional areas for their non-wood values.

Evidence presented below indicates that the sawmill industry would be significantly reduced by adopting this alternative while the pulpwood industry would lose a significant proportion (~34%) of the Crown resource which would put it in a position close to the minimum operational level of 600 000 tonnes per annum described in the DEIS.

Clearly if a decision to constrict the industry was made it would be more prudent to set out to achieve specified objectives which would optimise the non-wood benefits.

Socio Economic Impacts

Extent of Reduction

The FEIS has outlined the likely socio-economic impacts of proposals to prevent logging in the areas of the Tantawangalo and Coolangubra State Forests that have been proposed for inclusion in the National Estate (page 6.19 to 6.23). If, however, a sawlog-only operation were to be permitted in these two areas, with no pulpwood extraction, significant economic impacts would still be experienced in the region. As set out in the FEIS, the region is heavily dependent on timber-based industries, and the overall economic effect of a reduction in any element of these industries would be considerable.

The following table summarises the reductions in resource that would occur, for both the pulpwood and sawlog based industries, if only sawlogging were to be permitted in these nominated areas.

	Sawlogs ('000 cu.m.)	Pulpwood ('000 tonnes)
Total resource in ENFMA (SDDEIS, p.44)	1200	10200
Resource in nominated areas	572	3840
Under "sawlog-only" operation:		
Resource available	339	411
Resource loss	233	3429
Loss as % total resource in ENFMA	19.5%	33.6%

These data indicate that if a sawlog-only operation (including heads and butts extraction) were to be permitted in the two proposed areas, then not only would around 34% of the total pulpwood resource of the ENFMA be lost to the industry, but so too would nearly 20% of the sawlog resource of the area. permitting a sawlog-only operation would thus NOT prevent an economic impact resulting for the region's sawmilling industry, from the prevention of pulpwood extraction from the two proposed forest areas.

Impact of Reduction

The FEIS (page 6.16) had indicated the importance of the current integrated management and harvesting operation of the ENFMA for the ongoing viability of the region's sawmills. Without the ability to extract pulpwood with sawlogs, certain areas become unecomic to utilise, and costs are greatly increased for the sawmills. A reduced volume of sawlogs is thus realistically available for the sawmilling industry, if the integrated operation were to cease in the nominated areas. At the same time, the ability to extract sawlogs will provide some resource from these areas for the pulpwood industry, in the form of sawmill residues.

On the basis of the resource reductions summarised in the above table, and drawing on the analysis presented int he FEIS (page 6.19 to 6.23), it is likely that not only would the pulpwood industry suffer a severe contraction as a result of the "closure" of these two State Forest areas, but the sawmilling industry would also contract. As set out in the FEIS (page 6.19), there is very limited scope for either the sawmilling industries or the pulpwood operation to obtain alternative (substitute) resource from other areas within the region. These reductions in scale of oeprations would create an economic impact on the region that would go beyond the resource loss itself, via the linkages that have been demonstrated to exist between the timber-based industries and the overall regional economy. Public sector finances would also be affected, adding financial impacts to these economic impacts.

Total economic impacts of a "sawlog-only" operation for the Tantawangalo and Coolangubra State Forest areas that have been nominated for inclusion in the National Estate are thus estimated to be:

Total jobs lost Total value of regional output lost Loss in Australian exports Net loss to Government revenue

409 \$14.9 million/year \$ 6.6 million/year \$ 6.1 million/year These estimates are based on the assumptions that the pulpwood operation would revert to a one-shift operation (as described on page 6.20 and 6.21 of the FEIS), while the sawmilling industry would reduce to around 75% of current levels. This latter estimate is derived from the assumption that a 20% reduction in resource availability, which is not readily replaceable, would cause one of the four major sawmills of the region to close.

Employment Direct employment lost would consist of 48 from the sawmilling industry, together with 49 at the chipmill. To this must be added the employment lost from harvesting and transport functions, and also service industries supplying the timber industries. A further 312 jobs are likely to be lost in this manner, indicating a total of 409 jobs lost from the region as a result of permitting a sawlog-only operation in Tantawangalo and Coolangubra State Forests. This figure of 409 can be compared to the estimate of 528 jobs lost as a result of the total cessation of logging in these two forest areas, presented in the FEIS (page 6.23). the overall effect of this number of job losses to the region, in socio-economic terms, would be reflected in reduced level of total household income, small business closures, reduction in level of services provided, and likely population loss as the unemployed move out of an area that already experiences above-average (for the State) levels of unemployment.

Value of Output A reduction to a one-shift operation at the chipmill would cause the value of output from the mill to drop by \$6.6 million per annum. A loss of 20% of the available resource for the sawmilling industry, with concomitant reduction in output, could cause the value of output from the region's sawmilling industry to drop by \$2.7 million/annum. This direct decline of \$9.3 million could cause a total reduction of some \$14.9 million, each year, in the value of output from the region. All the reduction experienced in the pulpwood sector, totalling \$6.6 million, also represents an equivalent decline in the total annual value of exports from Australia.

Financial Flows to Government As described in the FEIS (page 6.22), any reduction in the volume of timber made available to the sawmilling and pulpwood industries will reduce royalty income for the State Government, thus reducing possible expenditure on roading, fire prevention, etc. in State Forest areas. An increase in unemployment also impacts on Federal Government finances, via a reduction in income tax payments received, and a requirement for additional benefit expenditure to the additional unemployed. It is estimated that while royalty payments could drop by \$1.6 million per year, the Federal Government would receive \$1.9 million (net after income tax on unemployment benefits is deducted) less in income tax receipts, per year, and have to increase total unemployment benefit payments by \$2.6 million per annum.

Summary

A "sawlog-only" operation for the Tantawangalo and Coolangubra forest areas proposed for the National Estate would thus have significant impacts on the socioeconomic environment of the region. Not only would the pulpwood industry be affected, via the loss of the resource contained in these areas, but the sawmilling industry would also suffer a loss of resource as a result of the cessation of an integrated harvesting operation in these forests. A proposal to extract only sawlogs from these nominated forests would produce socio-economic impacts that are only marginally different from the likely effects of a complete closure of these areas to the timber-based industries on which the regional economy is so dependent.

Impacts on Forest Management and the Environment

Sawlog-only operations would have significant impacts on forest management in the region but not on the environmental impacts occurring within harvested areas.

Roading

As discussed in the SDDEIS (page 45) the cost of roading in areas to be logged would be reduced to some extent. The FCNSW would be able to construct roads of a lower standard due to the reduced traffic flow.

Within logged areas the road network would be similar in length to that required for integrated harvesting. Obviously those areas uneconomic for harvesting would not be roaded.

The impacts of sawlog-only operations on the road network would be

Reduced roading costs, both in terms of road standard and extent.

Reduced impacts of roading within areas uneconomic to harvest. (Some roading may be needed through parts of these areas to access adjacent viable areas.)

Potential impacts likely to be reduced include: sedimentation (Ref. FEIS, point 6, page 8.9 and point 3, page 8.11); loss of primitiveness (and associated recreational opportunities).

The reduced road network will have an adverse impact on fire control in the region (Ref. Table 8.4 FEIS page 8.17 and page 8.19, para 2).

Silvicultural

The SDDEIS made mention of the silvicultural benefits accruing from harvesting some non-sawlog trees for pulpwood (page 45 SDDEIS).

Culling of non-sawlog trees is a routine practice in East Gippsland forests. Failure to adequately provide for regeneration through cull falling would significantly reduce the capacity of regeneration to achieve the potential productivity of the site.

The costs of cull falling were discussed in the DEIS page 3.5-3.6.

Environmental Impacts

Ferguson (1985) discussed the additional impacts likely to arise from extending existing sawlog-only operations to include pulpwood harvesting. By default equal reductions in impacts could be expected if pulpwood harvesting were excluded the following summarises Ferguson's findings. [References to pages and sections are from Ferguson's report.]

Nutrients [p. 242, Section 14.5.1]

Greater losses because more wood is removed this is not considered to pose a major problem providing an adequate programme of monitoring and assessment of growth rates.

Hence a minor improvement in the nutrient balance could be expected with sawlog-only operations.

Water [p. 243, Section 14.5.2.]

No change to roading network or stream crossings hence no additional effect on water quantity or quality.

Only small increases to the length of snig tracks and the extent of disturbed soil.

Hence a minor improvement is likely due to less disturbance and shorter snig tracks.

Recreation [p. 245, Section 14.5.3] Main adverse impace is additional truck traffic.

Hence a reduction in this traffic may reduce conflict between recreators and log trucks. However lower standard roads may make access more difficult.

Flora and Fauna [p. 245 and 246, Section 14.5.4]

Prescriptions and control of forest practices must make adequate provision for flora conservation irrespective of end uses for wood.

Specific habitat requirements, such as the retention of some trees with hollows, must be met whether or not pulpwood harvesting is involved.

Hence similar prescriptions would be applied within logged areas irrespective of the type of logging operation.

Clearly areas harvested for sawlogs-only will experience reduced impacts when compared with typical integrated operations. However, these reduced impacts are not likely to be significant in the context of impacts occurring as a result of undertaking the sawlog-only operation.

In Conclusion

On the basis of the information provided above adoption of sawlog-only harvesting cannot be regarded as a prudent alternative.

It would not optimise the non-wood benefits to be obtained by foregoing harvesting of significant proportions of assessed resources despite incurring the significant socio-economic impacts arising from a reduction in the level of operation of both the sawlog and pulpwood industry.

Adoption of this alternative would further restrict the FCNSW's ability to reserve other areas while meeting industry's resource requirements.

Within the logged coupe impacts would be reduced but not to a significant extent.

Effect on Sawmill Residue Resource of the LCC Option C

Option C put forward by the LCC would reduce the volume of sawlogs harvested from East Gippsland from the existing level of around 320 000m³ to 171 000m³.

The DEIS anticipated a reduction in the total volume of chip obtained from this source. The relevant figures are:

	DEIS (assumed volumes)	LCC Option C
Sawlog Volume (m ³)	213 000	171 000
Chips (tonnes)	~80 000	~65 000

On this basis if the LCC recommendations are accepted in total there would be a continuing shortfall of approximately 15 000 tonnes of chip annually from this source or 1% of the total 850 000 tonnes. Two factors may tend to reduce the

magnitude of this shortfall. The first involves the change in status of ex-quota logs which will subsequently be offered for sale under the VAUS system. These logs will have a reduced percentage recovery of sawn wood per gross volume processed than is typically the case for quota logs.

No precise data are available on the difference however, Vince Phillips (Duncans Eden) has provided an indication of possible changes.

Typically an average log has 21% defect (i.e. 21% of the log is not suited for sawn timber). In ex-quota logs this percentage can increase to as much as 50% leading to a significant increase in the volume of chip produced per cubic metre of timber processed.

In addition to the above the Victorian Department of Conservation Forests and Lands will apply a loading to royalty covering the sale of chipped residue to all sawlogs sold (Timber Industry Strategy page 76). This will encourage utilisation of residues by sawmills that currently burn this material. Again no estimate is available on the volumes available.

The figure used in the FEIS regarding the LCC recommendations (220 000m³/annum) was incorrect and resulted from a misinterpretation of an LCC press release (copy enclosed) which was the best available source of information at the time of printing.

Subconsultants Statement Page 8.21

All public submissions were read and assessed to determine if they contained additional information or raised issues not adequately covered in the draft document this work was prepared by Margules and Partners. Where this material pertained to sections prepared by subconsultants, it was passed on to the subconsultants for them to consider and to prepare additional information for inclusion in the final document.

With regards the flora and fauna sections we considered the SEFA, AHC, NPWS and FCNSW submissions collectively, presented the full range of issues and additional information which appeared in the public responses.

We forwarded the relevant sections of these submissions to the subconsultant on the basis that it would enable him to obtain a clear picture of the context in which the issues and information were presented. Hence in writing the sections he made note of the fact these submissions were considered in preparing his response.



MAXIMUM EXTENT OF FUTURE H.D.A. OPERATIONS FIGURE 1.1 Scale 1:1,000,000 A report prepared by the Australian Conservation Foundation entitled:

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Scientific Critique of the Joint Scientific Committee's Report: "The Biological Conservation of the South-East Forests."

Background

Following a protracted and often heated debate over the future of the native forests in south-eastern New South Wales, an agreement was reached between the Commonwealth Government and the State of New South Wales in 1989 to establish a Joint Scientific Committee (ISC) to prepare a report on The Biological Conservation of the South-East? Forests'. The final report of the Committee was released on July 19th 1990. Since its release the report has attracted considerable public debate and many scientists have expressed major reservations about various aspects of its contents including several of the final recommendations to government. For example, Dr Hugh Possingham (a Queen Elizabeth II Fellow and theoretical ecologist from the Ecosystem Dynamics Group, Research School of Biological Sciences at The Australian National University) stated in a press release at Parliament House on July 24th 1990 that ... until a comprehensive field-based research program is completed I cannot conclude that a continuation of logging will not endanger species nor permanently affect the ecological integrity of the forest ecosystems in south east N.S.W.'. More recently, on August 1st and 8th, several of Australia's most eminent forest ecologists and conservation biologists have discussed their major concerns about the report on the nationally-broadcast ABC Radio program 'Barthworm'.

The Australian Conservation Foundation (ACF) is also deeply concerned about many aspects of the Joint Scientific Committee's report. We believe that the report and its methodology have implications beyond the South East Forests as the Committee's approach to the issue of biological conservation may be considered seriously by agencies such as the Resource Assessment Commission in assessing the nature and extent of the biological reserves and management practices necessary to conserve the biological diversity in Australia's native forests. In light of these concerns, the ACF has prepared a scientific critique of the report with the assistance of an independent and respected forest ecologist, Professor J.B. Kirkpatrick, Head, Department of Geography and Centre for Environmental Studies, University of Tasmania, Hobart. The critique is detailed as six sections, below.

1. Outline of Critique

In preparing their report on the Biological Conservation of the South-East Forests' the Joint Scientific Committee has undertaken four main activities: (i) a review of existing biological data (on the south-east

forests of N.S.W and adjacent regions) and ecological theory; (ii) the collection and synthesis of some new and existing data for application to

a computer-based methodology for "conservation evaluation" application of the computer-based methodology to generate "conservation scenarios"; and, (iv) the framing of recommendations to government. While the biological data base compiled by the JSC provides a useful foundation from which to develop a scientifically-based conservation strategy for the south-east forests, the report itself has many serious shortcomings. In particular, the major deficiencies of the report lie less in its detailed analyses of the environmental variation in the south east forests and more in (i) its philosophical stance that logging should continue until it is proved guilty by science of crimes againstbiological conservation, and (ii) in a set of conclusions that do not flow from the data presented. In addition, in preparing the report the Committee has, at times, mis-interpreted and mis-used scientific data and theory. Overall, this has led to the introduction of many unacceptable biases and opinions into the report and, significantly, to the framing of several very mis-leading final recommendations. To some extent, these inadequacies are a part of the scientific process and would normally be removed/revised through peer review before the work could be accepted for publication. In this instance, however, the Committee's report has not been subjected to the normal scientific peer review before being passed to government.

The primary intent of this critique is to explain the major inadequacies of the JSC report. This discussion covers each of the four main activities undertaken by the Committee and also covers some important biological issues not mentioned in the report. In doing so, we make some comments on the immediate needs for a scientifically-based conservation strategy in the forests of south-east N.S.W.

2. Modern Principles of Biological Conservation, Reserve Design and Minimum Viable Population Size

Essential for the preparation of a scientifically-based report on the biological conservation of the south east forests of N.S.W. is a sound knowledge of modern principles in biological conservation, reserve design and minimum viable populations. Unfortunately, on the basis of the arguments and scientific references presented in the report we cannot conclude that the Committee is fully conversant with these principles. In fact, in many instances the Committee's interpretation of scientific data and ecological theory is demonstrably poor and very mis-leading or wrong. Ecological theory has changed substantially over the past two decades. Unfortunately, however, many of the recent and important advances in understanding have been overlooked by the authors. Often the theoretical literature cited in the report is old and has been superseded by new work. Examples of these inadequacies are:

(i) Reserve design: The methods used by the Committee to identify additional areas in south east N.S.W. worthy of reservation are currently grossly inadequate. A critical problem relates to the lack of distinction between past and current land uses within environmental domains. This means that old growth forests (for a definition see below) are given the 2

same biological standing as forests that have been logged and that

townships, cleared land and pine plantations appear within the indicated reserve system. Further, the reserve design promoted in the report fails to adequately consider the size and spatial patterning or connectivity of reserves. The optimal shape of a reserve is circular. Long, thin reserves as advocated in the report (Fig. 7.3, p. 300) are considered undesirable biologically (Saunders *et al.* 1987) and can be expected to be more costly to maintain than reserves with circular shapes. Given the likelihood of climate change, large heterogeneous reserves afford more chance of conserving the biological values of these forests than small reserves.

(ii) Minimum viable populations : Most of the ecological theory on minimum viable populations considered in the report is outdated and would not stand the test of peer review. Based on genetic and demographic theory the Committee considers that several hundred individuals is a viable population size for most species (p. 272). However, recent research indicates that many other factors need to be considered when evaluating minimum viable populations (Soule and Kohm 1990). Environmental fluctuations and extreme episodic events (or catastrophes) like drought, flood, fire and epidemic are normal in the Australian landscape. These phenomena can reduce populations of species to a small fraction of their normal population density at a site and may lead to local extinction. As a consequence, the minimum population size necessary to maximise the probability of persistence over a few hundred years is considered to be at least several thousand individuals, not several hundred.

Recently a more pessimistic picture of species extinction has been discussed which suggests that the minimum viable population for many species is in the order of tens of thousands of organisms. Based on mammals in south-western United States, Belovsky (1987) for example suggested that a rabbit-sized organism requires a population size of tens of thousands to have a 95% chance of persisting a thousand years.

Unfortunately, the worked examples on minimum viable populations used by the Committee are frequently based on incorrect empirical data. An average home range for a Greater Glider, *Petauroides volans*, for example is about 2.4 ha (Hume and Smith 1984), not the 1.2 ha cited by the authors on page 272 of the report.

Given these inadequacies, the statement made in the Executive Summary (p. ix) by the Committee - "There is no scientific evidence to indicate that current management practices will result in the extinction of any organism, either plant or animal." - is at best very misleading. Population dynamic and genetic theory states clearly that any reduction in the size of a population increases the probability of extinction. Current forestry practices significantly reduce the population sizes of many species and increase the probability that those species will become extinct over a given time interval. Therefore, a correct statement is that there is no scientific evidence to suggest that current forest management practices will not jeopardise the persistence of many forest-dependent species in south east N.S.W." and

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The potential impact of forestry practices on the invertebrate fauna and non-vascular plants, in particular, is problematic as scientific knowledge of these groups is exceedingly limited. This uncertainty is significant and should not be discounted lightly as these species are essential to the maintenance of forest site productivity through time.

3. Assessment of the Theoretical Basis of the Computerbased Methodologies applied by the JSC

The Committee has adopted two main computer-based methodologies to characterise the spatial heterogeneity of environments and potential habitats of forest taxa. The first methodology is termed an "environmental domain" analysis and follows that described by Mackey et al. (1988, 1989). The second methodology is the Bioclimate Prediction System known by the acronym BIOCLIM (Busby 1986, Nix 1986). Both methodologies are under active development at The Australian National University (CRES Annual Report 1988, 1989) but, to date, the theoretical basis of each has not been tested.

Intuitively, the conceptual basis of the "environmental domain", approach appears scientifically valid and may afford a significant advance over any existing methodology for the rapid and quantitative characterisation of the degree of environmental variability occurring within terrestrial landscapes. However, the extent to which these abstract environmental domains reflect the range of biological variation in reality (on the ground) remains to be investigated. In fact, Mackey et al. (1988) stressed this very point and cautioned against the inadvertant use of the methodology - "The utility of the bioenvironments [i.e. environmental domains] in guiding as to where significant shifts in biotic response should occur is a function of both how good the stated ecological model is and how accurate the estimates of environmental regimes are. What constitutes a good ecological model or result can only be gauged by assessing the extent of biological correlation with the gradients or groups generated by a classification." (Mackey et al. 1988, p. 512). Clearly, the authors saw this methodology as an important first step in any systematic attempt to identify the biological diversity of a landscape. The second and complementary step was a field-based, biological research program to test the predictions.

A further difficulty arises concerning the most suitable hierarchial/ agglomerative level to select when classifying the environmental domains. The chosen level determines the number of domains (i.e. characterises and sets the degree of environmental heterogeneity) that the nominal region is taken to support. Currently, the availability of objective and tested procedures to evaluate the most appropriate level of classification is limited. The adoption of an untested classification may significantly affect any subsequent, related analyses (Dr C.R. Margules, on 'Earthworm', 8th August). Frequently, the level of classification chosen by researchers is arbitrary and effectively represents a compromise between not too few domains to cover some of the observed spatial variability and not too many so as to be unmanageable. Unfortunately, in this case the report fails to provide any information as to how the level of classification was selected for the south east forests. This is omission is unscientific as it renders this phase of the environmental domain analyses unrepeatable.

Mackey et al. (1988, 1989) employed the environmental domain methodology at two scales of spatial resolution to characterise and compare the range of environments found in the Wet Tropic rainforests of north east Queensland to elsewhere on the Australian continent. In doing so, the authors were able to provide some insight into the extent to which the environments of the Wet Tropic rainforests were distinct from elsewhere. However, it was only when this <u>contextual</u> information was combined with a wealth of biological and other information on the region that a strong case was built to argue that these rainforests were worthy of World Heritage listing. <u>This process was quite unlike the</u> <u>current situation</u> where very detailed site-based, biological information is required to help determine which forests may or may not be logged and the most appropriate locations to site conservation reserves.

Nix (1986) described the climate estimates and mathematical algorithms underpinning BIOCLIM. He emphasised that BIOCLIM was only a first sieve that could be used to attempt to provide some idea of the potential distribution of taxa in the absence of more precise information on their distribution and abundance. Predictions of the potential distribution (presence/absence) of a species is made solely on the basis of a range of (estimated) climate attributes. Clearly, however, many other factors operating at both a broad and finer-scale (e.g. shelter and food requirements, fire, competition with other species, fire, chance) may determine where a species can survive.

> 4. Assessment of the Practical Application of the Computer-based Methodologies by the JSC

Although some limitations of the environmental domain analyses are mentioned in the report, these have typically been overlooked by the Committee in their apparent enthusiasm to apply the methodology and interpret the computer-generated outputs.

Two fundamental problems exist with the environmental domain analyses as currently presented. Firstly, the failure of the authors to detail explicitly the assumptions adopted in applying the environmental data base to select the number of domains to represent the environmental heterogeneity within the region makes this part of the domain analysis untestable. Secondly, even if this step had been undertaken rigorously, no attempt has been made to test the computer-based predictions on the ground. Clearly, a major problem arises due to the absence of any field-based biological research to test the computer predictions. Without this research is should be obvious that a cautious interpretation of the predictions would have been appropriate. 5

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Unfortunately, the Committee has not adopted such an approach. Instead, on the basis of the statements and recommendations given in the report, it appears that the Committee has often taken these untested, computer predictions and analyses literally.

Since no comprehensive, field-based biological research has been undertaken to determine the extent to which the environmental domains reflect real on the ground biological patterns, it is <u>not</u> possible to determine scientifically which forest areas <u>may be</u> logged. However, in reviewing the existing biological data and other non-wood values of the south east forests, it appears possible to determine some of the forests that should not be logged. In this regard, the scientific evidence favours, on balance, the retention of large natural areas for the longtermmaintenance of biological values. Specific forest areas considered worthy of reservation have been discussed elsewhere (Jenkins and Recher 1990, Pyke and O'Connor 1990).

The report has used extrapolations of site-based biological data within environmental domains to indicate the "adequacy of sampling" of different biotic groups (Chapter 4). From this, a basis for conservation reserve analysis is established in later chapters of the report. We believe that the use of extrapolations in this manner is scientifically invalid. In effect, the methodology has two critical assumptions: (i) the environmental domains are spatially homogenous for the target biotic groups and (ii) the location of field sites from which the biological data are obtained are representative of the range of habitats found within the domain. Both of these assumptions are very unlikely to be correct, particularly for large domains or domains encompassing variable terrain. Neither assumption is adequately explained or tested.

The use of this scientifically-invalid technique would explain the results obtained by the Committee concerning, for example, the apparent "abundance of sightings" of species like the Yellow-bellied Glider, *Petaurus australis*, and the Powerful Owl, *Ninox strenua*, which are considered to be relatively uncommon to rare in the region (see p. 145). In reality, these analyses show that the existing biological data on many groups of forest biota are incomplete and not representative of their niche. Therefore, many of the predictive analyses adopted in Chapter 4 of the report are exceedingly mis-leading or wrong.

The Committee used BIOCLIM to predict the potential habitat of two marsupials (Long-footed Potoroo, Koala) which are considered rare in the south east forests. On the basis of these analyses, the Committee then suggests in the Executive Summary (p. ix) that 'Rare species, in marginal habitat or at the limit of their range, such as the long-footed potoroo and the koala, may require habitat manipulation for them to survive in small local populations.' Again, implicit within this statement is the assumption that BIOCLIM is an accurate predictor of the habitat of these species. In both cases this is almost certainly <u>not</u> true. The Long-footed Potoroo, for example, is known from only a handful of sites which may or may not be representative of its complete environmental range. New records of the animal will change its bioclimatic profile and probably significantly change its predicted potential distribution based on climate. 6

Moreover, it is considered that parameters such as ground cover, accessibility to a year round supply of fungi and predation are <u>critical</u> <u>determinants</u> of habitat for the species (Seebeck and Scotts 1989). These parameters are not considered by BIOCLIM.

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In addition, it is essential to remember that even where BIOCLIM is able to predict the habitat of a species with some reliability, it does so only on the basis of presence, not abundance. Accurate knowledge of the abundance of species is also essential for developing rational management decisions. Currently, this information cannot be generated reliably by computer models. Therefore, detailed ground surveys are essential components of forest management and conservation strategies and will need to be undertaken in the region before recommendations about the most suitable places to log will be possible.

Overall, the current recommendations of the Committee in no way accomodate the conservation and management needs of the Long-footed Potoroo or Koala.

5. Biological Implications of Disturbance in Multiple-use Forests

The use and the abuse of the term 'old growth forest' is addressed in the report in an unfortunate way. It is obvious that old growth forest only occurs as a result of regrowth, so the conservation of old growth forests requires both. We regard old growth forest to be largely unmodified forest of whatever age or mixture of ages of trees.

The JSC report misuses the ecological theory that disturbance may promote diversity to imply that forestry practices are useful in maintaining species diversity. The basis of this argument is the 'intermediate disturbance hypothesis' which was derived from limited observations on grasslands ecosystems from the Northern Hemishere. In addition, it is assumed that maximising diversity at all sites is important. The latter assumption is unequivocally wrong.

Disturbance may, or may not, promote biological diversity. The type, shape, size and intensity of a disturbance may influence its effect on diversity. Overseas research has shown that site disturbance often increases diversity on the local scale, but decreases the more important regional diversity. This is particularly relevant to the current intensive forestry practices which are undertaken on a broad-scale in the south east forests. We believe that large areas of relatively intact native forest that experience a natural disturbance regime are essential to a viable conservation strategy for the south east region. Logging practices do not constitute a natural disturbance regime. To conclude, the major deficiencies of the report lay less in its detailed documentation of the environmental variation in south east N.S.W. and nearby and more in:

(i) its philosphical stance; and,

(ii) a set of conclusions and recommendations that <u>do not</u> flow from the data presented.

The authors of the report seem to take the attitude that logging should continue until it is conclusively proved guilty by science of crimes against biological conservation. Thus, they labour to make a difficult and irrelevant distinction between places and areas (a place can hardly be dimensionless) and then assert that extremely detailed and conclusive biological evidence should be available before any place should be listed on the National Estate. On this basis the Tasmanian Wilderness World Heritage Area would not be listed on the Register of the National Estate. They concede that places (= very small areas) could have National Estate values but reject blanket listing of areas (= large areas). In doing this the authors assume that the viability necessary for listing under the representativeness criterion can be achieved within a matrix of land managed primarily for wood production. However the balance of the existing scientific evidence does not, in our opinion, point in this direction, and the record of adherance to various codes of forest practice is door.

We believe that the balance of the scientific evidence favours large natural areas for the longterm maintenance of biological values. The retention of the few substantial areas of largely unmodified National Estate and associated forests in south east N.S.W. is likely to contribute more significantly to nature conservation and more cheaply than the attempted restoration of bush on farmland that is part of the scenario suggested in the JSC report. It is only within large and heterogenous areas that there will be room for response to climatic changes and space for the continuation of species dependent on infrequent natural disturbance events.

In many places the need for further research is highlighted in the report. Given this lack of information, particularly regarding ecosystem dynamics and processes, we believe that a continuation of logging in National Estate forests will increase the risk of permanent changes to the ecological integrity of the forest ecosystems in south east N.S.W., including the extinction of species.

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SUBMISSION TO THE RESOURCE ASSESSMENT COMMISSION FOREST AND TIMBER INQUIRY

by John Formby and Roland Breckwoldt

For THE TANTAWANGALO CATCHMENT PROTECTION ASSOCIATION

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RECOMMENDATIONS

1. The RAC should affirm and support the need for a further shift away from growth oriented and materialistic values and decisions towards greater recognition in policies and decisions of the value of the natural environment. This includes not only its role in enhancing quality of life, but ultimately in ensuring the survival of the planet's ecosystems and of humankind.

- 2. In order to ensure that environmental values are fully recognised:
 - The principle of environmentally sustainable development should be correctly defined to mean the sustainability of natural ecosystems. This principle should then be applied in any decisions concerning Australia's native forests.
 - Decisions about the use of the forests at national, regional and local levels should include full and public review of all the options, including the non-development option. These reviews should be scrutinised by an independent body of non-foresters. The Land Conservation Council in Victoria may provide a useful example of such a body.
 - Fundamental changes should be made to the institutions, including legislation, structure, and management of the government agencies responsible for the forests, in order to ensure that they abandon wood production - dominated values and give environmental values sufficient weight in decisions.

3. A comprehensive independent review of the Forestry Commission's environmental impact assessment procedures should be instituted. They are conceptually flawed and inadequately implemented, and cannot provide the guidance necessary to protect the important water catchment, wildlife conservation, Aboriginal heritage and recreation values of Tantawangalo and Devils Creek, and other environmentally significant forest areas.

4. It is recommended that the trial logging programme in the Tantawangalo catchment be abandoned immediately because of its limited scientific validity.

5. The listing of the Tantawangalo Catchment on the Register of the National Estate is a valid recognition of its values and should be seen as a precursor to its dedication as a National Park.

6. The Report of the Joint Scientific Committee should be subjected to peer review by a group of appropriately qualified scientists drawn from organisations such as the CSIRO Division of Wildlife Ecology and the Australian Ecological Society.

7. All logging of existing and interim listed National Estate areas in the South-East should be stopped. A definitive study, including detailed ground surveys to establish locations and populations of fauna in the South-East forests should be established, with particular emphasis on rare and endangered species.

8. The results of the above study should be related to the physical and climatic data developed by the Joint Scientific Committee to provide a sufficient basis for defining a system of biological reserves.

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9. A reserve system should be defined which comprehends biological, scenic, wilderness, tourism, water catchment, archaeological, historical and Aboriginal heritage values

10. These reserves should be incorporated in a Greater Escarpment National Park.

11. The NSW Forestry Commission should be restructured into three separate organisations.

- A Timber Marketing Authority responsible for the pricing and sale of native hardwoods, including pulpwood. This organisation would have <u>no</u> role or responsibility in determining the quantity of timber produced from native forests. The authority would also be required by its legislation to give priority to value-added uses for timber.
- A Forest Conservation Commission, responsible for environmental management and timber production from properly identified low conservation value native forests. Its legislation would require it to give priority to environmental concerns over timber production. It should not be managed by foresters. The chief executive should be a qualified ecologist and the government body should be made up of a majority of non-foresters. This would be necessary to overcome the present major imbalance towards a timber production ethos.
- A Native Hardwood Plantation Development Authority required to promote and assist the development of native hardwood plantations on previously cleared farmland. This organisation would be given a mandate to develop a variety of approaches to the establishment of native hardwood plantations, ranging from direct investment in the purchase of land and planting of trees to assistance and incentives for landholders to establish plantations on their own land.

INTRODUCTION: THE REALITIES OF FOREST EXPLOITATION

The Tantawangalo Catchment Protection Association (TCPA) draws its membership largely from areas adjacent to logging operations in South-East New South Wales. The TCPA has literally been in the front line of efforts to conserve the native forests of the region for nine years. Its members, therefore, have a first-hand, day-to-day knowledge of the realities of logging operations and forest management in a way which is not directly available to the Resource Assessment Commission (RAC).

These realities are far removed from the purported policies and public justifications provided by the timber industry. The realities include not just the serious and unwarranted environmental damage caused by logging, but also fundamental failings in the resource management, decision-making and accountability of the industry. These failings are so deeply ingrained into the operations and ethos of the industry that recommendations by the RAC as to environmentally and economically sound policies and management practices will not be sufficient. For such proposals to be accepted and implemented will first require major changes in the objectives, values, organisational structure, public accountability and professional training of the industry. This applies particularly to the government agencies charged with managing the forests in the public interest.

Essentially, major organisational reforms are required which will bring about a shift from the present institutionalised over-emphasis on wood production to a far more responsible stewardship of the forests based on a clear understanding of ecological and sustainable economic values.

AN OVERVIEW OF THIS SUBMISSION

This submission focuses in part on the specific issue of the proposed logging of the Tantawangalo Catchment and the ongoing logging of the adjacent Devil's Creek catchment. But it is also concerned with the wider issue of the future of the native forests of the South-East region of New South Wales. This in turn leads inevitably to consideration of the quality of forest management and the need for major organisational changes to the NSW Forestry Commission. Many of the conclusions are applicable elsewhere in Australia.

The first matter discussed is the role of values in forest management and decisionmaking. This is a central issue underlying many of the problems and deficiencies of forest management, and one which is often ignored by claims of 'objectivity'. We are dismayed by the extent to which the NSW Forestry Commission has evolved wood production oriented values which it promotes and defends to the detriment of its environmental responsibilities. This is at odds with changing public perceptions of the environmental value of native forests. It is also incompatible with the urgent need for governments and communities to give far greater priority to environmental values in order to survive the gathering environmental crisis.

The RAC should examine explicitly the role of values in forest management, affirm the need for a much higher priority to be placed on conservation of the natural environment in forest management decisions and incorporate this priority in its own recommendations as to the future of the forest and forest-based industries.

Turning to regional issues, the importance of the Tantawangalo catchment as a source of water for regional towns and farms is described. Water supply from the catchment is extremely vulnerable to drought and to changes in water yield as a result of proposed logging.

The early history of the campaign to protect the Tantawangalo is reviewed. It is shown that there was strong local concern about proposed logging of the catchment for many years before the future of the South-East forests became a national issue. The National Estate listing of the area simply confirmed its outstanding natural values which had long been recognised.

The environmental impact statements produced on forestry operations in the South East and their failure adequately to assess environmental impacts are discussed in detail. Some important conclusions arise from this review:-

- The lack of responsiveness of the proponents (Harris-Daishowa P/L and the NSW Forestry Commission) to critical public comment, and the inadequacy of the EIA process as a means of ensuring public participation in forest management.
- the numerous instances where there is a lack of scientific study and evidence as to the environmental impacts of logging and forestry practices.
- the frequent lack of objectivity, failure to acknowledge conflicting evidence and making of assertions without scientific basis which characterise the EIS documents.
- the fundamental failure of the EIS's to examine feasible alternatives thoroughly, including those which involve lower levels of production or alternative sources of supply such as native hardwood plantations.

The EIS's are examined in some detail because their failings demonstrate that the NSV Forestry Commission, at least in its present form, is not an appropriate body to b charged with management of native forests, particularly with respect to decisions as t the logging or preservation of high conservation value old-growth forests. This point i further illustrated by the deficiencies in the 'trial logging' studies in the Tantawangal catchment and the pre-empting of the decision to log the catchment by the Forestr Commission and the NSW State Government.

The Report of the Joint Scientific Committee is given detailed consideration in the submission because pro-logging interests have given it a prominence far beyond the merited by its limited terms of reference and its substantive weaknesses. The Repoillustrates the initial argument put in this submission about the role of values i determining outcomes - in this case the clearly evident pro-logging biases of the bul of the Committee derived from their professional backgrounds in forestry.

It is concluded that while the data base assembled for the Report is potentially valuable its conclusions and recommendations are seriously flawed and it should be subject t independent review by a panel of appropriately qualified ecologists. Finally, some proposals are made for the disassembling of the NSW Forestry Commission into three separate organisations. It is the nature of the Forestry Commission itself which is a central cause of the problems in forest management being experienced in the South-East region. Drastic reorganisation is the only way to remedy the Forestry Commission's extreme wood-production bias and its excessive power and independence.

THE ROLE OF VALUES IN FOREST INDUSTRY MANAGEMENT

No decisionmaking is value-free. While economic techniques often fail to make their underlying value assumptions explicit, these nevertheless exist, built into the methodologies used. An example is the choice of discount rate when calculating net present value.

Decisions made by foresters are inevitably influenced by their personal values and those of their organisations. When the Eden Regional Forester, Mr Tony Howe, says "when I look at this [forest] I see dollars", (Higgins, 1990) he is stating a value position which will inevitably influence his decisions on forest management.

However sophisticated the techniques of economic and environmental analysis used, these can only provide additional information about the consequences of choices between completing options. The actual choice between options will still require the application of a set of values. A forester and an ecologist, for example, given exactly the same information about the effects of options for the use of a forest, may well reach quite different conclusions about desirable end use. The RAC cannot meet the requirements of section 7 of its Act "to optimise the net benefits to the community from the nation's resources ...", without making value judgements as to the relative benefits to the community of alternative uses of the forests.

Within Australian society values such as the desirability of "growth" and "development" are still being promoted despite the increasing public understanding of the environmental limits to growth. Unless the RAC explicitly defines its value framework, its findings may incorporate by default a value position which accepts that Australian society will proceed on much the same lines as at present. That is, with a predominant emphasis on economic development and resource exploitation and only some marginal concessions to environmental concerns.

These values are inappropriate for a future in which the natural environment will be an increasingly scarce commodity subject to great pressures from population growth, development and pollution. A future of "more of the same" is both undesirable and eventually untenable. It will mean more pollution, more environmental destruction, a declining quality of life and ultimately an unavoidable decline in the viability of the Earth's life support systems.

It is possible to create a future which is environmentally sustainable and can maintain a high quality of life for Australians. However, this will require a fundamental shift away from present materialistic and development-dominated value systems. The new values will place far greater weight on conservation of the natural environment and on the non-materialistic components of the quality of life of Australians.

While environmental values are increasingly recognised by the community their true worth is not reflected in decisions about the use of resources. This occurs both because of failings in economic pricing mechanisms and decision-making processes in dealing with environmental values, and because of the economic power and momentum of the private and public sector organisations which benefit from the exploitation of natural resources.

Commonwealth government policy requires that decisions should be based on the principle of environmentally sustainable development. If the RAC accepts this principle then it is essential that the principle of sustainability is operationalised throughout its deliberations. In order to do so, the RAC should scrutinise its economic and other analytical methodologies to ensure that these are consistent with the principle of environmentally sustainable development. It should also specifically demonstrate that each of its significant recommendations is consistent with this principle.

While implementation by the RAC of the principle of environmental sustainability is important, it is not a sufficient means of ensuring that environmental values are given adequate weight in its findings. First, sustainability is open to being defined too narrowly. When the NSW Forestry Commission claims that its operations in the South-East forests are sustainable (a claim which is demonstrably incorrect) it means sustainability in terms of timber production. Sustainability in terms of the long term survival of the original ecosystems and species involved is a different issue.

The ecosystems and species of the South-East forests, their interdependencies and requirements for survival, and their potential value to humankind, are far from fully understood. For this reason common prudence dictates that in applying the concept of environmental sustainability an extremely conservative approach should be taken by the RAC in its recommendations as to the use or preservation of the forest resources. This will provide a necessary contrast to the operations of the NSW Forestry Commission, which as this submission will show has proceeded with intensive logging operations without adequate knowledge of the affected environment or of the effects of logging on it, and without sufficient regard for such information as is available on these matters.

There is a second, and central, reason that the principle of environmental sustainability alone is not a sufficient basis for ensuring that environmental values are given sufficient weight in recommendations and decisions as to the future of the forests. While a proposal for resource use may be environmentally sustainable it may not be the <u>optimum</u> use or preservation of the resource. There is a danger that demonstration that a development is environmentally sustainable may sidestep the question of whether or not the non-development option, or some other form of development, may be preferable when environmental values are fully taken into account. The flawed implementation of the process of environmental impact assessment has not resulted in meaningful review of options.

Even when the principle of environmental sustainability is adopted, when all relevant development options are considered and all relevant information is examined, final choices will still be highly dependent on the sets of values adopted by those bodies such as the RAC charged with making recommendations or decisions.

It is therefore recommended that:

 The RAC should affirm and support the need for a further shift away from growth - oriented and materialistic values and decisions towards greater recognition in policies and decisions of the value of the natural environment. This includes not only its role in enhancing quality of life, but ultimately, in ensuring the survival of the planet's ecosystems and of humankind.

- 2. In the case of the forest inquiry, this will mean ensuring in the RAC's recommendations that the principle of environmentally sustainable development, correctly defined to mean the sustainability of natural ecosystems, should be applied in any decisions concerning Australia's native forests.
- 3. Decisions about the use of the forests at national, regional or local levels should include full and public review of all the options, including the no-development option. In order to ensure that the appropriate values are applied, these reviews should be scrutinised by an independent body of non-foresters. The Land Conservation Council in Victoria may provide a useful example of such a body.
- 4. Major changes should be made to the institutions, including legislation, structure, and management of the government agencies responsible for the forests, in order to ensure that they abandon wood production dominated values and give environmental values are give sufficient weight in decisions. These proposed changes will be further discussed in the course of this submission.

THE TANTAWANGALO CATCHMENT

The importance of the Tantawangalo catchment first came to prominence as far back as 1937 when the Department of Public Works investigated the possibility of a district water supply scheme for the then Imlay Shire Council. The report was completed on 18 October 1937 and describes the catchment in a way that is as relevant today as it was at the time of writing:

"The waters of the Tantawangalo River are derived from an unpolluted catchment area. There is no habitation whatever on the upper reaches of the river, the area being entirely Crown Land. The gathering grounds are composed of granitic slopes covered in most parts with moss and thick undergrowth, consisting of maiden hair, bracken, small ferns, small black wattle and other indigenous plants. There is a mass of leaves all over the catchment which collect and retain the moisture and give it out gradually but continuously into small rivulets which feed the main stream. The general conditions are ideal to give excellent runoff. I regard the upper reaches of the Tantawangalo as a very effective gathering ground. The water is of exceptional quality."

It is salutary to examine the population of the towns to be supplied by the Tantawangalo scheme in 1937. Merimbula with a population of 475 was barely larger than the village of Candelo with 448 people. The total population of the towns on the proposed scheme was only 2,455 with an additional 225 rural users. It was estimated that the scheme could meet the water requirements of the towns even allowing for a population increase of 50 percent. Subsequent growth overran this estimate yet the Tantawangalo catchment has continued to meet the needs of the rapidly growing coastal towns.

The Tantawangalo catchment above the water supply weir is 10,250 ha in area. Approximately 9,750 ha of this is forest that falls within the Glenbog and Tantawangalo State Forests while the remaining 500 ha is uninhabited grazing land in the head-waters of the catchment.

The weir is lower in the catchment and gravity feeds a pipeline to the coastal town water supply scheme. The weir is only approximately three metres high at its greatest height and backs up water for only approximately 40 metres. It therefore has virtually no storage capacity and relies on the continuous stream flow of the Tantawangalo Creek. In other words, the forested catchment is the foundation of the water supply scheme. This small weir supplies the water requirements of the towns of Candelo, Wolumla, Merimbula, Tura, Pambula, and Pambula Beach and rural users along the pipeline. The total population of these towns was 8,400 or 32 percent of the people in Bega Valley Shire. This proportion swells to 42 percent during the peak holiday periods. Many rural users depend on the water that flows over the weir for domestic, stock and irrigation purposes.

While the forest above the weir was the focus of concern in the early part of the campaign to protect the Tantawangalo catchment, there is now increasing realisation of the importance of the adjacent Devil's Creek (also known as McCarthy's Creek) catchment as a water supply to the rural community and its koala and other wildlife habitat values. At the height of the 1979-1983 drought all the water caught by the weir was required to meet the needs of the towns and rural users depended entirely on the flow entering the Tantawangalo below the weir from Devils Creek.

The 1979-83 drought highlighted the importance of the Tantawangalo catchment. Merimbula suffered economically as tourists avoided the area due to water rationing. The farming community faced heavy irrigation restrictions at a time of severe drought and economic hardship. It should be emphasized that the newly-completed Yellow Pinch Dam near Merimbula is for off-peak storage from the Tantawangalo scheme. This dam has virtually no catchment capacity and is not an alternative to the Tantawangalo scheme. Indeed, since it depends on being filled by the pipeline from Tantawangalo Creek weir it makes the protection of the catchment even more significant.

Another statement on the importance of the Tantawangalo catchment is contained in the report by the Shire Engineer to the Bega Valley Shire Council meeting of 23 February, 1981 at the height of the most serious drought in the Bega Valley since European occupation. It stated:

"The Tantawangalo Creek weir has virtually no storage and directs the creek flow to Candelo, Wolumla, Tura, Merimbula, Pambula, Pambula Beach, and rural consumers and also Eden when surplus is available. The catchment area for the weir is about 102 km² with 97 km² State Forest and the remainder freehold land. To date the catchment has provided a remarkably consistent flow of good quality water with no treatment necessary. Full flow has been maintained in the pipeline during the current drought with low level flows in the creek more than twice the flows in the Towamba River, a river with a catchment area of over 1000 km²."

THE EVOLUTION OF THE CAMPAIGN TO PROTECT THE TANTAWANGALO

Among the rhetoric generated by the conflict to protect the south east forests are statements to the effect that many people are being misled by urban conservation groups that do not understand or appreciate the benefits of the forest management regime introduced with the woodchip industry. It is implied that the conflict over the south east forests follows an agenda set by the peak urban-based conservation organisations such as the Australian Conservation Foundation and The Wilderness Society. In this scenario, local citizens concerned about the future of the forests are manipulated by the powerful major groups. Nothing can be further from the truth. The campaign to protect the Tantawangalo began in the local community and continues to fully involve those people.

The conflict over the south east forests has become a national issue partly because the local community could not defend its interests against the powerful alliance between the State Government Forestry Commission and a national timber industry lobby. The gradual involvement of more people has simply brought to the attention of the wider Australian public the beauty and value of the south east forests. A brief history of the campaign to protect the Tantawangalo catchment follows to illustrate the point.

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In early 1981 intensive logging for woodchips took place on the private property that comprises only three percent of the Tantawangalo catchment. Even though this took place high in the catchment some 12 km above the weir it was sufficient to cause, according to the Shire Engineer in his report to Council on 23 February 1981, "more turbidity than would normally be expected" when rain fell earlier in the month. Accordingly the shire Engineer's report to the Council carried two important recommendations which should be stated here in full:

> "That representations be made to the Minister responsible for the Forestry Commission to stop any plans to log the catchment area and that full discussions be held with Council on the future use of the area."

> "That the catchment area be proclaimed a catchment district under Ordinance 45 of the Local Government Act so that some control can be exercised over the private land in the catchment."

Both recommendations were passed as resolutions by the Council and it wrote to the Department of Public on 26 February 1981 to begin the process of having the catchment proclaimed a Catchment District under the Local Government Act. A letter to the Minister for Forests, the Hon. A.R.L. Gordon, objecting to logging the catchment was typed and signed by the Shire Clerk but was never sent. The file copy has printed on it "not sent - pressure from F.C." (presumably Forestry Commission). The letter that was eventually sent to the Forestry Commission was dated 23 March 1981 and asked for an environmental impact statement on any proposal to log the catchment. However, a letter sent to the Merimbula Area Chamber of Commerce sent on the same day stated:

"Council feels that the catchment cannot be logged without detriment to the water quality and quantity and will be pressing strongly to the retain the catchment in it's natural state."

This high incidence of turbidity being coincidental with the logging was also noted by the local rural and urban community. For example, the Merimbula Area Chamber of Commerce resolved to ensure protection of the catchment and wrote to the Council on 4 March 1981 to state its position and asked Council to take appropriate action.

Community concern over the future of the Tantawangalo catchment resulted in a public meeting held in Candelo Public Hall on 10 March 1981. The meeting was attended by over 150 local residents and was addressed by the Shire President, the Secretary of the Bega Valley Water User's Association, the Regional Forester and a local farmer.

The majority of people at the meeting felt reassured by the strong stand being taken by the Council at the time as the Shire President spoke from a prepared statement on the importance of the catchment and the resolutions passed by the Council at its February meeting. However, the strength of the interest in protecting the catchment shown at this meeting resulted in the formation of the Tantawangalo Catchment Protection Association.

The first indication that there might be a trial logging prior to logging the entire catchment followed a visit to the Tantawangalo by hydrologists from the Forestry Commission and the CSIRO on 15 and 16 April 1981. At its meeting of 24 June 1981 the Bega Valley Shire Council accepted the Shire Engineer's recommendation that he be authorised to discuss research proposals for the Tantawangalo catchment with the Forestry Commission and the CSIRO.

Nevertheless, on 31 April 1981 the Acting Secretary of the Forestry Commission wrote to the Bega Valley Shire Council stating that there was already sufficient research in the Eden Forestry Region to adequately plan the logging procedure in the Tantawangalo catchment and prevent damaging its catchment values. The letter closed with a reassurance that the Commission would consult more fully with the Council in logging the catchment.

Consequently, the Regional Forester at Eden wrote to the Council on 20 July 1981 stating that the Commission was about to construct a new road for logging in Glenbog and Tantawangalo State Forests that would intrude in the catchment and that specifications for logging the Tantawangalo catchment were being prepared. However, in a sudden reversal the Regional Forester wrote to the Council on 29 July 1981 withdrawing his notification of the proposed roading, saying that "The Commission has now decided it does not want to go ahead with the survey and construction in the near future."

The next correspondence about logging the catchment to the Council from the Regional Forester was not until 3 August 1982 wherein he described a proposal for a study in the Tantawangalo catchment. He further proposed that a committee comprising the District Soil Conservationist, the Council's engineer in charge of water, a Forestry Commission hydrologist and the Regional Forester be appointed to 'monitor' the study. The Tantawangalo Catchment Protection Association then made strenuous efforts for one of its members to be officially appointed to this committee but was refused membership by the Regional Forester.

It was obvious now to the entire community that Bega Valley Shire Council was weakening its resolve to protect the catchment. The Far South Coast Environment Group wrote to the Council on 26 August 1981 asking Council to adhere to its earlier resolutions. The letter also pointed out that once public money was spent on a study there was less likelihood of the Forestry Commission abandoning its plans to log the catchment. Council replied to the Group on 1 September 1982 stating it had "considered" the Forestry Commission study at its meeting of 27 August and had decided to request the Commission to extend membership of the committee to monitor the study to include broader community representation. The same letter was sent to the President of the Conservation Council of the South East Region and Canberra and this is the first official indication of the wider interest of the conservation movement in the Tantawangalo catchment.

The Regional Forester responded to the requests being made for broader community representation in a letter of 15 September 1982 stating that it had been decided by the Commission to restrict membership to the four people nominated in his original proposal. Council then wrote to the organisations which had made representations for a broader membership and merely reiterated the Forestry Commission decision. There was no evidence of the Council making further representations on behalf of its

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community interest groups and putting any pressure on the Forestry Commission to review the narrow membership of the Committee.

The capitulation of the Council over logging in the Tantawangalo catchment and its failure to defend the community interest by insisting on broader membership of the committee resulted in another public meeting being called at Wolumla public hall on 22 November 1982. The background paper and the agenda for the meeting was prepared by the Tantawangalo Catchment Protection Association and stated that a major reason for the meeting was that Council was ignoring its earlier decision and was now "doing a deal with the Forestry Commission."

This meeting was a stormy affair as timber workers had been bussed to Wolumla from all over the region. The Secretary of the Water Users Association put the case for the protection of the Tantawangalo but he and any local residents who supported him were simply drowned out with abuse. This overwhelming majority of timber workers from outside the local area was an early indication of the wider conflict that would develop over the south east forests.

The motions that the Tantawangalo Catchment Protection Association put before the meeting were lost and the motions expressing confidence in the Forestry Commission put by Dr. Bill Hurditch, Director, Forest Products Association of New South Wales, were carried. It is significant that the timber industry was sufficiently prepared at this early stage to bring Dr. Hurditch to the meeting from Sydney.

The Tantawangalo Catchment Protection Association was now acutely aware that the timber industry and the Forestry Commission had combined their resources to campaign for logging the catchment and that the issue had gone well beyond the local community. The demoralising result of the Wolumla meeting prompted the Association to write to, and seek advice and assistance from, the Australian Conservation Foundation, the National Parks Association of New South Wales and the Total Environment Centre.

The different position adopted by Bega Valley Shire Council was evident in a new resolution passed at its February 1983 meeting:

"Prior to any logging of the catchment of the Tantawangalo Creek, an Environmental Impact Statement be prepared by an Independent Authority such as the C.S.I.R.O. and that representations be made to the Local Member Mr. John Akister to have such an E.I.S. carried out by the Government at the Government's expense."

Council duly wrote to the State Member for Monaro, Mr. John Akister, seeking his support for the resolution. However, Mr. Akister replied on 11 March 1983 with a somewhat indignant letter stating that the concept "--- is not only outside the provisions of the Environment, Planning & Assessment Act but also seems to indicate a lack of confidence in the Forestry Commission to provide an objective Environmental Impact Statement. I have to say that I have absolute confidence in the Forestry Commission of N.S.W. and their ability to provide an objective Environmental Impact Statement."

The Department of Public Works had replied to the Council's request that the Tantawangalo catchment be proclaimed a Catchment District in a letter dated 24 May 1981 asking for details of the proposed boundary. No reply was sent by the Council and finally on 26 November 1982, nearly two years since the initial Council resolution, the Department wrote again asking for confirmation of boundaries so that the catchment could be gazetted. The Council then replied that it agreed with the proposed boundaries. However, by August 1990 the catchment had still not been proclaimed.

Not that doing so would have resolved the conflict because the provisions of the Public Works Act only apply to the very small area of the catchment in private ownership and do not have any control over the Forestry Commission.

THE NATIONAL ESTATE LISTING

The timber industry has been actively assisting the spread of misinformation about the status and importance of an area being listed as part of the National Estate. The brief history outlined above demonstrates that the campaign to protect the Tantawangalo catchment began long before it was added to the National Estate in 1989. The process of placing Tantawangalo on the Register has simply been to draw attention to its special values. These special values are:

- the exceptional quality and quantity of water produced by the Tantawangalo catchment
- it is a complete catchment of relatively undisturbed old growth forest (it is correct that some of the more easily accessible parts of the catchment were selectively logged in the past but this was under a very different regime from both modern forestry practices and woodchipping in particular - the only exception being the 81 ha involved in the so-called 'trial logging' in late 1989)
- the Tantawangalo Creek is a spectacular watercourse which qualifies as a wild and scenic river over much of its length.
- the recreational opportunities and catchment values of the Tantawangalo are a far more important economic resource than woodchipping and euphemisms such as 'multiple use' cannot mask the fact that forestry operations in the catchment are in conflict with these values.
- the importance of relatively large areas of forest for the conservation of fauna and flora are now well documented (see Australian Museum Report for example and the responses by independent scientists to the Joint Scientific Committee report)

These attributes of the Tantawangalo catchment are the reasons why it was placed on the Register of the National Estate. They also show why it should be withdrawn from the woodchip concession and remain on the Register after it has been declared a national park just as other existing national parks are also on the Register.

THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The first EIS produced on the woodchip concession area was that prepared by Harris Daishowa (Australia) Pty. Ltd. (HDA) under its obligations to the Federal Government for renewal of the export licence in 1989. The draft EIS was released in April 1986 and the TCPA made a detailed submission that drew on many of the critical comments that had been written by sub-consultants and actually appeared in the document. This submission was totally ignored in the final EIS - a somewhat surprising outcome when the draft EIS under the proponents name contained numerous damning statements about the lack of environmental data on which the woodchip industry had operated under and was now seeking to renew for another 20 years.

. . .

It is difficult to understand how a supposedly objective analysis of the draft HDA EIS could ignore statements obviously made by its expert sub-consultants in the EIS such as:

"Despite the professed interest of the Forestry Commission of New South Wales in maintaining water values, the 1982 Eden Native Forest Management Plan contains no description of the water resources and hydrology of the area. There is also a notable absence of detailed discussion regarding the intuitive hydrologic effects of the forestry practice and preliminary findings of experimental projects designed to investigate these matters."

and regarding fauna:

"There is a long way to go before achieving the levels of knowledge and integration of wildlife and timber management that have been achieved in some forests elsewhere, notably in the United States. Indeed, in terms of basic survey data on the geographic distribution of the fauna, knowledge of the Eden Management Area is much less than for the adjacent forests of East Gippsland.".

Given that there were numerous such comments in the draft EIS and that many people and organisations lodged submissions, it seemed inappropriate at the very least that the final EIS presented in December 1986 did not recommend any change to the quota, or management to produce that quota, that satisfied any criticism made during the public review process. Many people therefore took the view that the invitation to make submissions on any EIS associated with the Eden woodchip industry was merely tokenism and could not be regarded as a genuine attempt at public participation.

Another view was that the Forestry Commission and HDA had a common interest and that since the former is a government body, it would be impossible to obtain an objective assessment on behalf of the State government and many of the individual agencies and officers known to be critical of the industry.

The view upheld by the Land and Environment Court was that the Forestry Commission was derelict in its duty by not producing its own EIS on the Eden woodchip operation. It is incredible that a small local conservation organisation, the Towamba Valley Catchment Protection Association, had to carry a lengthy legal challenge against the Forestry Commission to prove this point. It is an indictment of responsible government and environmental planning and management in Australia that this should have been the case. Surely, it is the role of government to control the environmental affairs of its own organisations and ensure that they meet the same responsibilities as private individuals and private enterprise.

DEFICIENCIES IN THE FORESTRY COMMISSION EIS IN TERMS OF THE LAND AND ENVIRONMENT COURT JUDGEMENT

In the course of his judgement in the Land and Environmental Court, Justice Hemmings noted that 'it is obvious that the prime consideration of the first respondent (the Forestry Commission) is its responsibility to meet its 'quota'. Steps to be taken to preserve flora and fauna, or to ensure the preservation and enhancement of the environment, appear to be secondary....' Justice Hemmings referred to a number of deficiencies in earlier EIS's concerning Forestry operations in the Eden area. Several deficiencies arose from the failure of previous EIA documentation to meet some of the requirements of the NSW Director of Environment and Planning. It was clear that Justice Hemmings took the view that these failings would need to be remedied in any Forestry Commission EIS (FCEIS) intended to conform with the requirements of the NSW Environment and Planning Act 1879. However, in many important respects the FCEIS did not remedy the defects identified by Justice Hemmings. The following notes some of these defects and considers the extent to which the 1988 FCEIS remedied them.

Flora and fauna

'...<u>inadequate information on the distribution of flora and fauna and their communities</u> to enable assessment of impacts' (Hemmings, 1988 pp 36.37).

- The FCEIS provided lists of locations of vascular plants and rare and threatened species (Appendices 5 & 6). However, it admits serious reservations about the accuracy of its detailed maps of forest types
 - (pp 36,37) and its information on plant communities (p 39). The discussion of impacts on vegetation is negligible (p 70). Almost total reliance is placed on reference to previous EIS documentation, with no consideration of the many deficiencies referred to by Justice Hemmings based on evidence given by expert witnesses in the Land and Environment Court.
- Similarly the discussion of impacts on fauna in the FCEIS notes only that 'research is continuing to define better the correlation between vegetation types and animal species groups and densities....'(p 70).

Research

<u>... an ongoing programme and commitment to formal survey, research and monitoring</u> is not sufficiently examined or proposed' (Hemmings, p 38).

> Various research projects are mentioned in the FCEIS and those of the Forestry Commission are described in Appendix 7a. However, the FCEIS does not clearly demonstrate how these provide the necessary elements in an integrated programme to remedy all the important existing deficiencies in the information required to assess impacts.

Hydrology

'... deficiencies in information on hydrology and drainage' (Hemmings, p 39)

The FCEIS describes two research programmes intended to indicate the impact of 'harvesting' on catchments (pp 51-58). Although the Yambulla study is said to have 'provided the basis for assessing the impact of management on runoff quantity and quality' (p51) the information given largely concerns a comparison of the hydrological responses of a catchment logged and then burnt by wildfire with those of an undisturbed catchment, thus not providing results relevant to catchments not burnt by wildfire. The study does show that catchments both logged and burnt by wildfire are likely to be very slow to recover to previous hydrological patterns (p. 57), a point not reflected in the summary of impacts at the beginning of the FCEIS.

- There is no discussion of any results of the Yambulla study concerning the important question of the effects of logging on low flows. The summary of impacts also omits this topic.
- The FCEIS clearly proposes logging in the Tantawangalo catchment, yet the hydrological studies in the catchment are outlined only in Appendix 7a.
- In general, little or no attempt has been made in the FCEIS to recognise and respond to the extensive criticisms, such as those made by Day (1987) of the deficiencies in the previous EIS's information on the effects of forestry activities on water quantity and quality and erosion.

Impact on economy, government and community

<u>'... inadequate information on impacts on the local economy, employment patterns</u> and on costs to government and the community' (Hemmings, 1988, p 39).

- The FCEIS included considerable information about the economic and employment benefits of the project and returns to government. Some matters which are referred to as benefits in regional terms, (for example additional schools, p 83), at a State level would be regarded as additional costs.
- The review of economic impacts makes no analysis of research such as that by Parker (1986). This shows that Australia appears to have been receiving low prices for its woodchip exports by comparison with other suppliers, and raises concerns about the implications of subsidies for woodchip exports for Australia's international trade agreements.
- The section on social impacts (pp 82,83) is completely inadequate. It makes no attempt to quantify social costs and benefits, relies on selective opinions and dubious generalisations and ignores many categories of social impact and the wide range of techniques available for measuring and assessing social impacts (for example see Formby, 1986).

Alternatives

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<u>'... the previous EIS's did not consider the ramifications of removal of Tantawangalo</u> and Coolangubra from the supply area' (Hemmings, p 40).

- The FCEIS provides additional data as to the economic impacts of not logging the Tantawangalo and Coolangubra areas. It does not, however describe the environmental and other benefits which a decision not to log these areas would have.

Examination of the consequences of not logging Coolangubra and Tantawangalo would require full examination of all feasible alternatives. As shown in the following section of this submission, the FCEIS does not do so.

The criticisms of previous EIS's identified by Justice Hemmings in his judgement should have been remedied by the Forestry Commission in its subsequent EIS. That many of them were not rectified is a further illustration of the cavalier attitude of the Forestry Commission towards its legal and environmental responsibilities.

THE ANALYSIS OF ALTERNATIVES

2. A.A. 14

There are now three environmental impact statements on the Eden woodchip concession:

Harris Daishowa (Australia) Pty. Ltd. 1986 (HDA 1986)

Forestry Commission of NSW 1988 (FC 1988)

Forestry Commission of NSW 1990 supplementary EIS (FC 1990)

None of these EIS's properly address the alternatives to the preferred option. For example, the 1990 FCEIS states at the outset (section 3) that the proposed operations are aimed at maintaining both the woodchip and sawmill industry at existing levels. It makes no serious attempt to address alternatives to the preferred option despite a great deal of new evidence brought forward since the 1988 FCEIS was released. For example, the South East Forest Alliance (SEFA) Peace Plan is dismissed as a result of an assessment by only one person with a forestry background. At the very least, a special advisory committee comprising independent experts from a variety of backgrounds should have been appointed to properly assess the SEFA proposals.

It is important to emphasize that even the most pessimistic estimate of resource availability made by the Commission still constitutes an alternative. It is stated quite clearly in the Harris Daishowa Draft Environmental Impact Statement 1987 (HDDEIS) that the mill would remain viable at 650 000 t/year. Moreover, at that time the plantation option had not been developed to the stage where it is now regarded as a potential source of woodchip material within 20 years. Quite clearly, even though the actual resource figures might be under dispute, the discrepancy is not sufficient to argue that it would close the mill. Therefore, there are alternatives to the preferred option. The general unwillingness of the Forestry Commission to explore alternatives to the preferred option is endemic to both the 1988 FCEIS and the 1990 FCEIS.

The Forestry Commission makes the assumption that an alternative, in order to be acceptable, must provide the same level of employment and economic activity as the preferred alternative (FCEIS 1988, p 97). This assumption is mistaken. The EIS process should identify the alternative which has the most acceptable combination of economic, environmental and social benefits. This may be one which provides a lower level of employment than others, but has greater environmental benefits.

A second failing in the treatment of alternatives in the various EIS's is their elimination by disaggregation. In other words partial alternatives are dismissed because they cannot individually replace the level of activity provided by existing logging operations. What should have been examined is whether a <u>combination</u> of these partial alternatives (eg. plantations, flitchmill) could provide a less environmentally damaging alternative to logging the most environmentally valuable areas of the native forests.

MEASURES TAKEN TO PROTECT THE ENVIRONMENT

a) Flora and fauna

There is no evidence to support the claim that either the management plans or the Preferred Management Priority (PMP) system can or will meet the obligations of the Forestry Commission under either its own Act or the Environmental Planning and Assessment Act. This is evidenced by the dereliction of duty by the Commission in a number of cases. The two most prominent and public of these cases is the Commission's failure to locate the existence of the long footed potoroo prior to logging and roading in its habitat despite its repeated claims of pre-logging faunal surveys and secondly, the commencement of logging the koala habitat in compartment 2453 of Tantawangalo State Forest without an adequate pre-logging survey. The most disturbing aspect of the latter case is that the Commission told the public that it had completed a consultants report on compartment 2453. However, further investigations have revealed that no such survey took place (The Canberra Times, 24 Feb.)

The discussion on measures to protect the environment contains many statements that are not supported by evidence or reference to scientific papers that might (or might not) support the claims being made. For example, it is stated that the comments made by the National Parks and Wildlife Service on the 1988 FCEIS, particularly the matters raised about the need to protect the full range of plant communities, have resulted in the Commission rectifying all ".... identified gaps in the reserve system" (P 14). This is an important claim and if correct would answer many of the Forestry Commission's critics. However, there is no evidence of any kind to show whether this deficiency has actually been rectified or whether it is merely convenient rhetoric for advocacy purposes.

Another example of a loose generalisation presented as evidence is the statement regarding the distribution of the tiger quoll in the ENFMA (1990 FCEIS p 27) where it is said '--- it would be mainly confined to the more remote National Parks'. There is absolutely no scientific evidence presented to support this opinion or to show why it is not just as likely to be found in remote State Forests such as Coolangubra and Tantawangalo. A similar unsubstantiated claim is made regarding the aquatic fauna on page 34 of the 1990 FCEIS.

Yet another claim that is of some significance to the whole debate about the future of the South East forests is the statement that regeneration monitoring shows that trees species composition in the regrowth following logging is "--- very close to the original forest composition" (4.5.2.4, p17). This is a very general statement that hides some very specific issues viz; is it the original species that are merely present or does the plant community and species distribution resemble the original ecosystem? Again, there is no supporting evidence to allow any proper evaluation of the claim presented in the 1990 FCEIS.

There is, however, evidence that the current management strategies for the Eden Native Forest Management Area cannot adequately accommodate the conservation of the regional fauna and flora. Dr. Harry Recher, Department of Ecosystems Management, University of New England, in an Affidavit of November 1989 which made extensive criticism of the FCEIS, states that "... the amount of old growth forest in the region will be significantly reduced. The remaining old growth forest will be highly fragmented and separated by extensive areas of regrowth forest 0 to 40 years old. Such regrowth cannot by itself sustain all wildlife dependent on old growth forest and there will be significant changes in species abundance and composition of communities of species as logging proceeds. Although the Eden Management Area will remain predominantly forested, the emphasis on pulpwood production will mean that the original forest ecosystem will be extensively modified with a greater proportion of younger and smaller trees and an age class patchiness imposed by the coupe systems of logging."

b) Soil erosion

The 1990 FCEIS is gravely deficient in the treatment of soil erosion and catchment management. It is well known that the granite soils of the region are highly erodible and that soil erosion constitutes a major environmental hazard. In a report to the Bega Valley Shire Council, 13 April 1981, the District Soil Conservationist at Bombala, Mr. C. Marshall, described the Devonian granetoid soils of the region as having a high to very high erosion hazard if disturbed or bared of vegetation' and 'clay fractions can be expected to be dispersible with resultant turbidity problems in run off ---- the catchment's role as a water supply cannot be over-emphasized."

There are at least three major issues concerning soil erosion that have not been subject to the degree of scientific investigation necessary to justify a further twenty years of integrated logging:

b.1) Logging operations in the coupes

The aspect of bedload (larger particles of sand, silt and gravel that are not held in suspension) that enters the stream as a result of logging has not been addressed in any study used to justify integrated logging. This is because the research equipment in both the Yambulla and proposed Tantawangalo studies comprise 'crump' weirs which are incapable of measuring bedload. Consequently, there is no scientific basis for the statement; 'There is no evidence of increased bedload movement (mobilisation) onto or down creeks arising from forest harvesting operations.' (1988 FCEIS 1v).

b.2) Adequacy of filter strips

The reason given by the Forestry Commission for the assumption that bedload does not enter streams is that it is prevented from doing so by filter strips of natural vegetation that is left intact along watercourses (see for example, 1990 FCEIS 4.3.2 p 8). However, Dr. Diana Day, a highly qualified hydrogeomorphologist and now a senior officer of the NSW Department of Water Resources, stated in a consultancy report of November 1987 commissioned by the Tantawangalo Catchment Protection Association, that: 'Bedload transport and distribution is a high function of discharge, and particularly extreme precipitation and runoff events. If any land cover is disturbed a likely rise in runoff volumes will move more bedload for the extreme runoff events.' Dr. Day stated that the claim by the Forestry Commission that filter strips and logging debris comprise an effective barrier to increases in suspended and bedload quantities has no substance and concluded that: 'The statement is at variance with geomorphic and engineering principles.'

b.3) Unconsolidated sediments

The problem of unconsolidated sediment accumulating in the coupes following logging that could be released into the streams during extreme events such as heavy precipitation following wildfire has not been addressed in the EIS despite the concerns raised by Burgess (1984).

Another major cause of soil erosion is that which results from the extensive network of roads that comprises the essential infrastructure for integrated logging. The 1990 FCEIS attempts to justify a total of 136.3 km of unsealed secondary access and feeder roads together with 506.4 km of logging tracks. This constitutes a massive environmental impact that is barely addressed.

The provision of guide-lines for roadbuilding does not constitute environmental impact assessment. There is no scientific justification given for this major environmental impact, despite the fact that unsealed road surfaces are a major source of erosion material in logging operations. Roading is only briefly discussed and in the most general terms. This must be regarded as a major deficiency given that long term studies of the problem have been carried out by the Melbourne Metropolitan Board of Works (1980) which stated; 'Preliminary data from the study show that unsealed road surfaces generate some 40 000 kg/ha/annum of sediment compared to less than 500 kg/ha/annum from undisturbed forested catchments, that is an increase in the sediment production of 80 times.'

c) Hydrology and catchment management

The 1990 FCEIS does not adequately address the environmental impact of forestry operations in the ENFMA. Appendix 4, which includes the site specific information carries the sub-heading of 'Hydrology' and it must therefore' be assumed that any comments made on this issue are treated by the Commission as having been adequately assessed in its 1988 FCEIS. However, that document is gravely deficient in matters hydrological.

The results of the Yambulla studies are used to discount many of the adverse impacts on water quantity and quality (1988 FCEIS p 51). But further analysis shows that there are doubts about the validity of the Yambulla studies even within the same EIS. Hydrologists in other States, or more importantly, working for other agencies, are not driven by the same imperatives and appear more willing to allow the necessary time to collect adequate data. The Melbourne and Metropolitan Board of Works (1980) described the progress of one of its major studies thus:

The forest on three experimental catchments in the North Marondah Experimental Area was clearfelled in the summer of 1977/88 and three densities of regrowth forest established. It will be approximately 20 years before the long term pattern in streamflow yield from these catchments can be firmly established.'

Notwithstanding, the Yambulla study is quoted as showing that turbidity (used as a measure of erosion alone instead of in conjunction with bedload as should be the case) increases following logging and roading with an apparent return to normal within five years. As stated above, there remains a great deal of doubt about the conclusions that can be drawn from the Yambulla studies, however, the assumption that a return to normal after a few years means that logging is justified is erroneous because it overlooks the cumulative impact over 40 years as each logged sub-catchment makes its contribution of erosion material. This continuing addition of material is then started

again as the logging enters its second 40 year cycle. This serious cumulative environmental impact is not addressed in either of the 1988 FCEIS or the 1990 FCEIS.

The results of trials carried out in small sub-catchments cannot be guaranteed to describe the response of a an integrated logging operation on the hydrological behaviour and soil erosion characteristics of the entire catchment on a continuous 40 year cycle. The Forestry Commission attempts to avoid this issue by saying (1988 FCEIS Appendix 3, 8.11) that 'Changes noted at the small catchment level are not detectable in larger catchments (Bega, Towamba, Wallagarah) and hence not affecting town water supplies.' It is not detectable because of the paucity of the resources allocated to the studies and this statement also raises the serious issue of the value of small sub-catchment studies when it is the entire catchment that is the unit of concern.

A further deficiency in the 1988 FCEIS is its treatment of the soil structure and its consequences on catchment hydrology. Appendix 6a, obscurely located in Appendix 1a, states 'Preliminary results show that logging destroys soil macropore structure and causes the soil surface to become sealed, thereby reducing infiltration and significantly increasing overland flow (Moore et al technical notes in preparation).' This is yet another example of a major impact on the environment that is evident in an EIS dealing with the south east forests but not justified on any scientific basis.

Of great concern is that there is not even acknowledgement, let alone analysis, in the 1990 FCEIS of evidence presented by Olive and Rieger (1989) that casts serious doubts on the validity of the paired catchment methodology used in the Yambulla studies and extensively elsewhere in Australia to interpret the impact of logging on water quality and quantity. The matters raised by Olive and Rieger must be fully investigated and their relevance to the Yambulla studies understood before the impact of logging on water catchments can be adequately addressed.

THE TANTAWANGALO 'TRIAL LOGGING'

The so-called 'trial logging' in the Tantawangalo catchment has been compromised in the Forestry Commission EIS where it is clearly stated that the 530 000 tonne annual quota from state forests cannot be met without logging the Tantawangalo catchment. Appendix 1a, section 5a FCEIS 1988, states that this quota '--- assumes that all areas nominated for harvesting will be cut.' The discussion on alternatives and the exclusion of Tantawangalo National Estate Forest(page 100 EIS) is simply a justification for logging the Tantawangalo catchment. Moreover, the Minister for Natural Resources, Mr. Ian Causley, in his press statement of 14 June 1988 committed the entire woodchip concession resource to Harris Daishowa before the 'trial' is complete.

Further doubt is cast on the scientific validity of the Tantawangalo trial logging in Appendix 6a, within Appendix 1a, where it is stated; 'As with the Yambulla project, inadequate record length will make it difficult, if not impossible, to predict the effects of an extreme runoff event on a logged catchment. Similarly, the complexity of sediment and hydrologic response may make it difficult to isolate specific cause and effect relationships from detailed observations in just three experimental catchments. The standard crump weirs on each catchment will enable suspended sediment but not bedload to be studied'. The Forestry Commission has also failed to justify the extremely short period of the trial. The four to five years study period before full scale logging of the catchment begins could indicate expediency rather than scientific research.

FIRE MANAGEMENT

It is apparent that the role of fire in shaping and maintaining the forest ecosystem is poorly understood. This is abundantly clear in the statement 'Wildfire has been an important part of the natural environment since the advent of white man.' (1990 FCEIS 4.5.2.4 p 18). Fire has been a major determinant of the biota of the Australian environment long before the arrival of Europeans. The role of fire in Aboriginal culture in the area has been neglected as well as the recognition that eucalypt dominated forests, and the fauna that depends on them are fire-dependent.

A highly selective interpretation of the impact of fire is evident throughout the EIS's produced by the Commission in order to justify the current operation. The short statement on page 18 of the 1990 FCEIS is an excellent example of a mass of internal inconsistencies in arguing the fire issue so that the layperson is reassured that fire per se is 'destructive' and that the Commission is manipulating the environment for the betterment of timber production and fauna and flora. This is a gross distortion of the evidence and should be replaced by a scientific analysis of the role of fire in the ecosystems concerned and the impact of the Forestry Commission fire regime upon them.

ABORIGINAL CULTURAL HERITAGE

The Aborigines of the south coast from Wollongong to near the Victorian border are commonly referred to as belonging to the Yuin tribe. However, this large geographic region was held by many different sub-tribes that are frequently referred to as separate tribes and on this basis the far south coast was occupied by three Aboriginal tribes. The Djiringandj tribe lived in the northern section from Narooma to Merimbula. The area between Merimbula and Twofold Bay was occupied by the Bidawal who were centred on Mallacoota. Each tribe occupied land that extended from the coast to the escarpment forests where it bordered the land occupied by the Ngarigo tribe of the Monaro. Early European historical records show that there was a degree of conflict between the coastal tribes and the Ngarigo resulting in open warfare at times.

Several prominent geographical features in the area are places of cultural significance to Aborigines. Merriman Island in Wallaga Lake was the first location designated as an Aboriginal Place under the National Parks and Wildlife Act (1974). Mumbulla Mountain near Bega was the subject of debate in the late 1970s when it became apparent that it was scheduled for logging. As a result of studies instigated to clarify the claims being made by local Aborigines the Mountain was excluded from logging and gazetted as Biamanga Aboriginal Place.

Goolaga Mountain (later named Mount Dromedary by Captain Cook and listed by the National Trust as a Landscape Conservation Area) is also regarded by the Aborigines of the Wallaga Lake community as a cultural site. It contains numerous individual sites used for initiation and sacred ceremonies. Clearly defined ceremonial grounds and other occupation sites also occur on Black Range just south of Bega.

There is no doubt that the coastline and its estuaries provided a rich resource base for Aborigines. Occupation sites such as middens are common along the coastal strip and can be readily observed because they occur where there is little vegetation and there is also high usage by Europeans. Another reason for the size of the coastal middens is that they contain the discarded shells from seafood whereas sites further inland are devoid of organic matter with only the stone artefacts remaining as evidence of occupation. The differences in apparent abundance and size of sites on the coast compared to those further inland leads to the common misconception that the forests were little used by Aborigines.

However, archaeological research in the forests around Bega (the Five Forests Study) in 1983 found that there was an average density of one site per 2.9 square kilometres. This demonstrated quite clearly that Aborigines made very significant use of the escarpment forests and confirmed that they were used much more intensively than previously assumed. These surveys suggest that there were probably two groups of Aborigines - those who lived along the coast and used its resources to a distance of around 3-5 km inland, and those who had the same tribal affiliations but were family groups that used the swamps and forests further inland.

The size and distribution pattern of sites is different in the forests than along the coast. The forest sites are smaller and occur along ridge lines used as natural routes between larger camps near swamps and watercourses. There is also some evidence suggesting that the forest sites are younger than those of the coast being only around 5000 BP. One reason suggested to explain this is that population increase gradually led to the colonisation of less favourable environments.

Aboriginal sites and other cultural issues associated with Aboriginal occupation of the area are totally neglected in the discussion on environmental impact assessment in the 1990 FCEIS. Nowhere in the document is an outline of the Aboriginal site surveys said to be the basis of site specific impact provided in Appendix 4. This EIS will be inadequate until full details are provided by the Forestry Commission on the Aboriginal site consultants, their survey methods, the duration of their surveys, and the areas surveyed.

DEVILS CREEK - TANTAWANGALO STATE FOREST

The forested catchment of Devils Creek, an area of approximately 3000 ha., has been nominated for addition to the National Estate because of its importance in maintaining one of the few viable populations of koalas in the South East forests. Additionally, it is an important water catchment for downstream water users particularly when the coastal towns are taking most of the water from the Tantawangalo weir which is approximately three kilometres upstream of the junction with Devils Creek. The forested catchment of Devils Creek is contiguous with the Tantawangalo National Estate forest and increases its potential to conserve the regional fauna and flora.

The most immediate threat to Devils Creek catchment is the logging and roading proposed in Appendix 4 of the 1990 FCEIS and the resulting fragmentation of koala habitat. The circumstances surrounding the Forestry Commission's total failure to assess compartment 2453 in Devils Creek for the presence of koalas prior to the

commencement of logging and roading are now well known (Norton 1989, Taylor 1990). It is therefore totally unacceptable that the 1990 FCEIS should propose further logging in the catchment (both in compartment 2453 and Area 8, comprising compartment 2432) without a proper scientific study of the area.

As a result of records of verified observations by the National Parks and Wildlife Service, the documentation over many years by the adjoining landowner Mr. Frank Peters and the investigation by Norton (1989), Devils Creek is now widely recognised as perhaps the most important remaining koala habitat in the south east. Devils Creek and the adjoining Tantawangalo catchment are likely to play a major role in conserving the koala in this region.

Recently, the New South Wales Government announced that it would be undertaking a scientific study of the koala in the south east forests. It is essential that no further logging or roading occur in Devils Creek until this study is completed, released and made available for public comment. This 1990 FCEIS and its proposals to continue logging and roading in Devils Creek are at variance with both the Forestry Commission's and the New South Wales Government's responsibilities for the conservation of rare and endangered species.

The above comments apply equally to the proposal in Appendix 4 to construct the 5.9 km Devils Creek Road during 1990 (Area 13 R3 (i)). The assessment of the likely impact of this road is cursory and dismissive of the major impact it will have in further fragmenting koala habitat and the fact it is built for the sole purpose of more logging. The failure to take into account the purpose of the roading, in addition to the impact of its actual construction, is a major failing of the Forestry Commission impact assessment procedure. This road and the eventual logging of the catchment will also impact on its hydrological characteristics and inevitably cause soil erosion. Again, these major impacts are dismissed briefly in the form of opinion and not evidence that should now be available after twenty years of woodchip operations.

CONFUSING FACTS AND VALUES: THE REPORT OF THE JOINT SCIENTIFIC COMMITTEE ON THE BIOLOGICAL CONSERVATION OF THE SOUTH-EAST FORESTS

Ask a trained forester and a professional ecologist to study the same area of native forest and they are likely to reach quite different conclusions about the way in which the forest should be used. This has certainly been the case with the Report of the Joint Scientific Committee on the Biological Conservation of the South-East Forests. Written by a committee of six with five members having backgrounds in professional forestry, the Report has been strongly criticised by many scientists.

Associate Professor Harry Recher, from the Department of Ecosystem Management at the University of New England, said that he was concerned that the areas nominated for reservation by the Committee were mostly small and isolated, thereby continuing the existing problems of a fragmented park system. He said the Committee, "did not appear to understand the difference between old growth forest and forest regenerating after logging ... or to appreciate the importance of National Estate forests."

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On the ABC program Earthworm, broadcast on August 6 and 8, 1990 several scientists with detailed knowledge of the South-East forests were highly critical of the report, and suggested that it should be subjected to formal peer review by the Ecological Society of Australian or the CSIRO Division of Wildlife and Ecology.

When the recommendations of "scientific" reports on matters of public importance are considered by the public and politicians, there is often insufficient recognition of the vital difference between the quality of the data on which the recommendations are based and the quality of the recommendations themselves. The process of reaching conclusions and making recommendations requires considerable interpretation and the exercise of value-judgements between competing priorities. The recommendations made will inevitably be affected by both the range of scientific skills and the personal and professional values of those making them.

In this case, with the future of the old-growth forests of the South-East at stake, it is vital that decision-makers and the public recognise that the bias in the membership of the Committee is reflected in the recommendations of its Report. To quote Associate Professor Harry Recher, "it was unfortunate that the JSC did not have among its members zoologists and people with a broader understanding of forest ecology and conservation biology. Balanced membership might have avoided some of the inconsistencies in the Report and its apparent support of logging interests."

Given the conflict between the views of the Committee and many other scientists, how can third parties choose between them? An important guide will be the extent to which the evidence, reasoning and judgements in the Report itself stand up to close scrutiny. Initial review reveals several major deficiencies in the Report which greatly diminish its value as a basis for decisionmaking.

These are as follows:

1. The Committee's terms of reference, were too narrow to provide a basis for land-use decisions.

The terms of reference set by the Commonwealth and New South Wales governments do not require consideration of Aboriginal heritage, archaeological, historical, wilderness, recreation, tourism, scenic and water conservation values. Nor do they require consideration of alternatives to logging native forests such as the development of native hardwood plantation on land already cleared. No final decision should be made without balancing all these considerations. Yet many politicians have continued to speak as if decisions could be based on the recommendations of the Report alone. According to Senator Cook, then the Commonwealth Minister for Resources responsible for establishing the Committee, it would "evaluate competing claims and propose management principles under which the industry needs of the region can be met while maintaining the conservation values of the national estate areas" (p_2) . While it may be convenient for politicians to claim that the Report has met these objectives, its restricted terms of reference made it impossible to consider many of the key issues necessary to propose valid solutions.

2. In general, the Committee interpreted its terms of reference even more narrowly

The use of the term "conservation value" in the third term of reference: "In a local, regional and continental context, ascertain the conservation value of forest types and the communities within them" provided an opportunity for the Committee to consider some of the broader issues, but it chose to restrict itself to the question of biological conservation. "The Committee is aware that this view not shared by the Australian Heritage Commission, which contends that all values of the National Estate Forests, both biological and non-biological, should be addressed" (p 40). In other instances, however, the Committee chose to go beyond its terms of reference to make gratuitous criticisms to the Heritage Commission and a number of additional recommendations.

3. The Committee failed to acknowledge the limitations which its terms of reference placed on the validity of its recommendations.

The Committee made recommendations about the location and extent of proposed reserves without acknowledging that these might well be modified by the many considerations beyond the interpreted terms of reference. For instance, the recommendation that "wood production should proceed within National Estate areas but not outside ecological reserves" cannot reasonably be accepted without consideration of several of the other values listed above. In making its recommendations the Committee should properly have made such limitations on them explicit.

4. Centrally, the Committee did not sufficiently examine and acknowledge the large body of scientific opinion and information which supports the reservation from logging of far larger areas than it recommended.

The Committee appeared to prejudge the issue in favour of continued logging in the National Estate in its Interim Report produced in December 1989. It stated there that "The Committee is sympathetic to the view that a satisfactory level of biological conservation in the National Estate forests can be achieved by co-ordinating the management of National Parks, Native Reserves and other such land units, with the management of multiple-use lands."

As well as Recher and Jenkins from the University of New England, scientists who have publicly criticised this as well as other aspects of the Report include Dr Hal Cogger and Dr Alan Jones of the Australian Museum, Mr Dan Lunney and Ms Elizabeth Dovey of the New South Wales National Parks and Wildlife Service, Dr Hugh Possingham from the School of Biological Sciences at the Australian National University, Professor Jamie Kirkpatrick, Head of the Department of Geography and Environmental Studies, University of Tasmania, and Dr Chris Margules of the CSIRO. Matters on which these scientists take issue with the Committee include the shape as well as the size of the proposed reserve system, the insufficient validation of the study's methodology, the important question of the probability of extinction of species as a result of logging, the Committee's apparent lack of knowledge of recent theoretical ecology and misunderstanding of some ecological principles, and its uncritical view of current forestry practices. These issues have a vital bearing on the location and size of any reserve system for the South-East forests.

5. The Committee did not sufficiently recognise the need for a conservative approach to reservation given the many areas of inadequate information as to the effects of logging on flora and fauna.

The Report repeatedly refers to the lack of information about the effects of logging eg on flora (p 331), fauna (p 336), koalas, eastern pygmy possums (p 339), aquatic fauna (p 343), and invertebrate fauna (p 207). The Committee's views on the conservation of invertebrate fauna typify its approach where information is deficient. A paper by the Australian Entomological Society commissioned by the Committee pointed out that there has been virtually no research into the invertebrate fauna of the South-East forests. Despite concurring with the Society's finding that conserving representative and adequate samples of plant communities does not necessarily conserve the associated invertebrate fauna, the Committee ". . .saw no reason to believe that an integrated system of ecological reserves, coupled with sympathetic forestry management practices, would not be an effective regional conservation strategy for these animals". In effect the Committee considered that the logging industry, not conservation, should be given the benefit of the doubt.

6. The Committee was excessively optimistic about the probability of extinction of species as a result of logging.

The Committee concluded that "there is no scientific evidence to indicate that current management practices will result in the extinction of any organism, either plant or animal (page ix)." However, any such lack of scientific evidence may simply be due to insufficient scientific study of the issue. In the case of a vital conservation issue such as the extinction of species, the onus of proof should be on the Forestry Commission and the timber industry to show that its operations will not lead to an increased probability of extinction. Nor is the Committee's conclusion borne out by the evidence cited in the body of its Report. The Report quotes Reed and Lunney: "woodchipping has the potential to push remnant populations [koala] to extinction" (p 339). It notes that the recent Australian Museum report by O'Connor and Pyke considered the tiger quoll and long-footed potoroo were the mammal species of greatest concern in terms of conservation (p 341) and that the powerful and sooty owls may be particularly vulnerable to logging operations.

According to Dr Hugh Possingham, there is "definitive scientific theory that those [logging] practices increase the probability of extinction". He said that recent literature, with which the Committee did not appear to be acquainted, has greatly increased the numbers of individuals considered to be required to ensure the long-term survival of a given species. Coupled with the extremely poor data on the populations of rare species in the South-East forests, and the lack of knowledge of the impacts of logging on them, this presents a strong case for the establishment of extensive reserve systems, not the generally small and scattered additional reserves proposed by the Committee.

7. The shape, as well as the size of the proposed reserve system is sub-optimal for both conservation and economic reasons.

The often narrow and scattered reserves proposed by the Committee, because of their long boundaries in relation to area, are more vulnerable to invasion by introduced predators and weeds, to fire damage, and to the effects of land use changes in adjacent areas. They are also less likely to meet the needs of species with larger ranges.

These problems also make them more costly to manage per hectare then large, consolidated reserves. Professor Jamie Kirkpatrick comments "in 20 years of conservation biology I have learned there are major problems with small reserves with long boundaries".

8. The methodology used in the Report to identify environmental domains and to select reserves is insufficiently validated.

The Report used climatic and topographic data such as rainfall, elevation, slope and soil characteristics as a basis for identifying environmental domains. It is then assumed that these physical characteristics will provide a sufficiently accurate indicator of the distribution of the flora and fauna within these domains to permit the design of an effective system of reserves by reserving a proportion of each type of environmental domain.

There is concern, however, that the relationship between the physical characteristics of the domains and the distribution of species is insufficiently validated in this case. Dr Chris Margules of the CSIRO Division of Wildlife and Ecology, says, "we know it works for some species in some places, and we hypothesize that it does work for all species, but we don't yet have the empirical evidence to say that categorically".

The Report does not appear to demonstrate adequately the relationship between biological data collected on the ground and the assumptions about the correspondence between the physical and biological characteristics of domains. It is therefore not clear whether or not the domains proposed for reservations provide an adequate sample of biological diversity. It will take some time before scientific debate over this point is resolved. In the meantime, prudence should indicate the desirability of maintaining a more extensive reserve system than proposed in the Report.

9. The Report fails to recognise the numerous deficiencies in forest management and their implications for the proposed reserve system.

A basic plank of the Committee's support for the limited reserve system proposed is its repeated assertion that "multiple use forestry including wood production can take place within National Estate Forests ... without compromising conservation values". The considerable scientific disagreement with this view as well as the lack of data on many aspects of the impacts of logging on flora and fauna have already been noted. The Committee also largely failed to address the numerous criticisms of current logging practices and policies. These include not only deficiencies in management prescriptions but failures to adhere to those prescriptions in practice.

A well documented example is the logging of an area in the Tantawangalo State Forest where sightings of koalas had been made by a local resident, Mr Frank Peters. This case is described in more detail elsewhere in this submission. The essence of the matter was that the fauna survey claimed by the Forestry Commission to have been carried out by an independent consultant was subsequently found not to have been done. A later report by wildlife ecologist, Dr Tony Norton of the Australian National University confirmed that it was highly likely that the area logged was koala habitat. If appeared that the Forestry Commission was in breach of its own legislation in not carrying out adequate surveys prior to logging. The koala is extremely rare in the South-East forests, and the logging of the habitat area shows a disgraceful lack of regard for wildlife values. There are numerous other examples of this kind which illustrate the way in which the productionoriented ethos of the Forestry Commission results in actions damaging to conservation values. Such criticisms of forestry practices have been extensively documented in response to the various EIS's produced by the Forestry Commission and Harris-Daishowa on the region, and are reviewed elsewhere on this submission.

A review of these criticisms by the Committee would seem to be highly germane to any consideration of the its fifth term of reference "... the impacts of forestry management prescriptions on conservation values, and any desirable changes". The Report includes a broad description of current management prescriptions and makes some recommendations for change, but largely fails to address the specific criticisms of these prescriptions or the failures to adhere to them. Rather, it notes that recent decisions in the New South Wales Land and Environment Court are likely to require "even more stringent preparation of EIS's than hitherto." This not only ignores the great body of evidence as to the lack of stringency of these EIS's. It also fails to consider the implications of the fact that Forestry Commissions had to be taken to court by an environmental group to be forced to produce an EIS in the first place.

Another key forest management issue which the Report does not address is that of the sustainability of proposed logging operations. If proposed rates of logging are not sustainable, there will be increased pressure on fauna and flora as excessive logging changes the composition and age structure of the forest. Because of the length of the logging cycle (about 40 years) unless a more precise way of modelling and projecting timber resources is developed, whether or not proposed rates of logging are in fact sustainable will not be clear for many years.

The draft Australian Museum report (p 24) argues that Forestry Commission calculations concerning future timber yield contain two assumptions that are not well supported. These are that on average the logged forest in the South-East will produce 3m³ of harvestable timber per ha per year, and that 15 percent will be utilised for sawlogs. It suggests that more accurate predictions of long-term timber yield are clearly required. A computer simulation model should be developed based on detailed information by area on species, ages and factors affecting tree growth such as aspect, elevation and rainfall. Without such a model, the Museum report says "planning is largely guess-work and forest management essentially a trial-and-error process" (p 30).

Given, therefore, the likelihood that the forest is not being logged on a sustained yield basis, this would have additional biological impacts and should have been addressed by the Committee. The uncertainty as to sustainability indicates once again the need for a more conservative approach to reservation than that adopted by the Committee.

10. The process of implementation of the proposed reserve system is likely further to reduce its degree of adequacy.

The Report does not define a "final" proposed reserve system. It provides indicative maps (which are small and extremely difficult to read) of the additional conservation areas necessary to reserve 5%, 10% and 20% of each of the 127 environmental domains identified in the study. But rather than any of those, it proposes a variable minimum area concept whereby not less than 5 percent and up to 100 percent of each domain be reserved but with a minimum reserve area of 10 km². This would allow for a higher proportion of smaller and more unusual domains to be preserved.

The difficulty with this approach is that it leaves the door wide open for the Forestry Commission, with its production-oriented ethos, to play the major part in final decisions. This will inevitably, lead to pressures to reduce both the area of additional reserves and the extent to which they contain forest which is of high value for timber production. An already inadequate proposed reserve system will become even more so.

CONCLUDING COMMENTS: THE NEED FOR A WIDER VIEW

The biases of the forester-dominated Committee are evident throughout its Report. These, together with its numerous deficiencies including its narrow scope and insufficiently validated methodology and conclusions, render its recommendations of little value. The information base developed for the Committee, with considerable further work to define fully the relationship between physical characteristics and flora and fauna, could be used as an important input for designing a reserve system. However, development of such a system would need to consider all the factors included in a wider definition of conservation, including recreational, scenic, water conservation, archaeological historical and tourism values. Centrally, recommendations as to a proposed reserve system should consider the development of native hardwood plantations as an alternative to logging native forests. The development of this option in the South-East has been both neglected and avoided by the NSW Forestry Commission. A recent report commissioned by the Commonwealth Minister for Resources (Landsbery, Jones and Pryor, 1990) has shown the feasibility of developing large scale native hardwood plantations in the South-East. Rapid development of these plantations would decrease the pressures by the timber industry to log the native forests which have worked against designation of an adequate reserve system.

The Committee's report should be subjected to peer review by an independent committee of appropriately qualified scientists drawn from organisations such as CSIRO's Division of Wildlife and Ecology and the Australian Ecological Society. This will confirm and detail the deficiencies in the Report and the procedures need to correct them.

The Report demonstrates the ultimate futility of governments appointing committees with an inbuilt professional bias. Where such biases are transmitted to findings and recommendations they are inevitably exposed by public review. Unfortunately a great deal of time and money are wasted in the process which would be better spent in seeking unbiased solutions.

INSTITUTIONAL CHANGES -REFORMING THE NSW FORESTRY ADMINISTRATION

There is an urgent need to restructure and reform the administration of the state forests in New South Wales.

Over time organisations develop their own internal norms, rules, values and organisational ethos. Once in place, these organisational norms and values tend to be difficult to change. The reasons for this can be found in the literature of psychology, social psychology and sociology. This literature will not be reviewed here, but a summary can be found in the PhD thesis of one of the authors of this submission (Formby 1984).

Where organisations lack strong external review and control, these shared organisational norms may increasingly diverge from external perceptions of the public interest. This is essentially what has happened with the NSW Forestry Commission. An ethos firmly based on giving priority to wood production has failed to respond adequately to changing public perceptions and pressures for reservation of much larger areas of old-growth forest. The Forestry Commission has revised some of its damaging environmental practices, but almost always reluctantly and as a result of sustained public pressure.

A second well-documented characteristic of regulatory organisations is their tendency to become captive of the industry they are supposed to regulate. In the debate over the South-East forests, the Forestry Commission and timber industry representatives have repeatedly adopted virtually identical positions and united to oppose conservationist's proposals. Often the Forestry Commission's conduct in pursuing its views has been one of poorly disguised hostility to environmentalists. This is clearly symptomatic of malfunction in a government agency which as part of its responsibilities should be seeking to balance and reconcile competing public interests.

Experience in reforming public sector organisations (eg in the case of the Hunter District Water Board - Formby & Day 1988) has shown that attempts at gradual reform tend to result in little change. A major, extensive and rapid reconstruction is needed to overcome the entrenched organisational resistance which arises from the persistent nature of the shared organisational norms and values noted above.

The NSW Forestry Commission should be restructured into three separate organisations:

1. A Timber Marketing Authority responsible for the pricing and sale of native hardwoods, including pulpwood. This organisation would have <u>no</u> role or responsibility in determining the quantity of timber produced from native forests. This authority would also be required by its legislation to give priority to value-added uses for timber.

2. A Forest Conservation Commission, responsible for environmental management and timber production from low conservation value native forests. Its legislation would require it to give priority to environmental concerns over timber production. It should not be run by foresters. The chief executive should be a non-forester and the governing board should be made up of a majority of non-foresters. This would be necessary to overcome the present major imbalance towards a timber production ethos.

3. A Native Hardwood Plantation Development Authority, required to promote and assist the development of native hardwood plantations on previously cleared farmland. This organisation would be given a mandate to develop a variety of approaches to the establishment of native hardwood plantations, ranging from direct investment in the purchase of land and planting of trees to assistance and incentives for landholders to establish plantations on their own land.

The Forestry Commission's softwood plantations could be sold to private enterprise. There is no pressing need for a government agency to continue to be involved in this area. The revised forest legislation should include strict prohibition of clearing of native forest on private or public land for the development of either hardwood or softwood plantations.

The proposed organisational restructuring would, if carried through with resolution, break down the production-oriented ethic within the new Forest Conservation Commission. It would do so by breaking the present nexus between timber production and forest management. This will be the effect of separating the timber marketing from the timber production functions, and placing the latter in a Forest Conservation Commission in which timber production is a secondary objective to conservation, and in which traditional professional foresters are no longer dominant.

Creation of a Native Hardwood Plantation Development Authority is necessary because of the abysmal failure of the NSW Forestry Commission to develop such plantations in South-East NSW. The report by Landsberg, Jones and Pryor has shown that contrary to Forestry Commission claims, sufficient suitable land with enough rainfall is available in the South-East region, and development of substantial hardwood plantations is feasible. However, large-scale plantation development cannot be expected to occur spontaneously. A committed organisation is needed to promote the concept to the usually conservative rural community, to finance research into the best species for local conditions, to fund annuity payments to growers, and to give confidence to investors as to financial security. The latter is particularly important given the long period between investment and harvesting. To quote Landsberg, Jones and Pryor "The promotion and financing of a viable plantations scheme requires a strong and continued commitment on the part of those responsible for it. It is important that farmers be persuaded of the wide range of benefits of trees on farms and that financial arrangements are beneficial both to the growers and the processors".

Experience shows that leaving development of hardwood plantations in the South-East to some arrangement between the NSW Forestry Commission, Harris-Daishowa and the Commonwealth government, as suggested by Landsberg, Jones and Pryor, will lead to inaction, delays and an inadequate and poorly developed plantation programme. Conflicting priorities within the above organisations, and their commitment to the continued maximum logging of native forests will ensure this result. A separate organisation is needed to activate a successful plantations program.

We believe that our proposal to divide up the NSW Forestry Commission is preferable to the Victorian form of restructuring which has created a mega-department by amalgamating forestry, parks and wildlife and other environmental functions. Large government departments tend to accrue too much power, and because of their size and relative impenetrability become less amenable to public and government scrutiny and control. Division into a number of organisations reduces the power exercisable by any one of them.

Large organisations are also inclined to internalise disputes which might better be the subject of public debate, such as bureaucratic disagreements between "conservation" and "production forestry" factions. While it may be helpful for governments to have potentially contentious issues resolved without public debate, this is against the principle of open government and may result in decisions which are opposed to the public interest. There is also a danger that because of the present size and power of the NSW Forestry Commission, its former staff and policies would come to play an excessively dominant role in any mega-department. By some reports this has occurred in the Victorian case.

Division of the Forestry Commission into these separate organisations will also have the benefit that the functions, costs and degree of success of each would be more readily apparent to the public. At present there are cross-subsidies and externalities which are not clearly attributed to the various activities of the Forestry Commission: for example non-payment of rates on public land used for timber production.

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EXPERT ADVISORS' CONTACTS - Continued... Page 2/2CORKILL V. FCNSW - NORTH WASHPOOL

Dr Tony Norton, Wildlife Ecologist, Centre for Environmental and Resource Studies (CRES), Australian National University, GPO Box 4, Canberra ACT 2601 >16 2494 758 dl, 06 2494 277 sw, 06 2977 507 h, 06 2490 757 fx Michael Olsen, Rainforest Botanist, Frank, 134 Englefield Road, Oxley QLD 4072 Ph 07 375 4962 - O'Reilly's, Green Mountain - Vince's House, 5 440 644 Ph, 075 440 638 fx epartment of Botany, University of Queensland, St Lucia 4067 J7 3975 2773 w (dl), 07 378 6547 h, 07 365 1699 fx Dr Will Osborne, Wildlife Ecologist, 17 Atkinson Street, Cooke ACT 2614 06 246 2490 w, 06 251 3829 h, 06 247 0852 fx * Dr Harry Parnaby, Zoologist and Mammal Specialist, Australian Museum, William Street, Sydney 26 Gibbens Street, Camperdown 2050 02 339 8296 w or 339 8114 w, 02 519 3364 h, 360 4350 fx Prof. Harry Recher, Forest Researcher and Ecologist, 🥖 66 Rusden Street, Armidale NSW 2350 FUL 067 732 019 w, 067 728 390 h, 067 733 084 fx 20 Prof. Len Webb, Rainforest Ecologist, Griffith University, Nathan, Brisbane 4111 P.O. Box 338, Alderley 4051 07 275 7111 w sw, 07 356 5782 h, Please Note: (*) denotes professional government service officers. They are not retained to advise, but may be or have been sub-poenaed. Their presence on this list does not imply any

imply any

further relationship with the case.





<< UPDATE No. 6. 18.12.1990 >> ASSISTANTS' CONTACTS CORKILL V. FCNSW - NORTH WASHPOOL Ms Joanne Bragg, Legal assistant to Mr:Robertson, 44 Martin Place, Sydney NSW 2000 Ph 210 4444 50 Cope Street, Redfern NSW 2016 02 210 4952 w, 02 698 4859 h, 02 235 2711 fx Mr John Corkill, Applicant, 3 Albert Street, Forest Lodge NSW 2037 NSW Environment Centre, 39 George Street, The Rocks 2000 02 247 4206 w, 02 660 3496 h, 02 247 5945 fx * Mr Dan Lunney, NPWS Forest Ecologist, Sydney Head Office NPWS, 43 Bridge St, PO Box 1967, Hurstville NSW 2220 02 585 6444 w(sw), 02 585 6555 fx Mr Aldis Ozols, Adviser, 9 Wood Street, Forest Lodge NSW 2037 Office of RSL Jones MLC, Parliament House, Macquarie St 02 230 2858 w, 02 660 1573 h, 02 230 2866 fx Mr Dailan Pugh, Adviser and Forest Researcher, PO Box 7, Old Bonalbo NSW 2470, 066 346 193 Yabbra Studio, 066 425 706 Sth Grafton, 066 420 619 fx (C/- NPWS Grafton) Mr Tim Robertson, Barrister at Law, 14 Pearson St, Balmain NSW 2041 Frederick Jordan Chambers, 233 Macquarie St, Sydney 2000 02 229 7337 w, 02 810 1416 h, 02 221 6036 fx * Ms Sue Walker, NPWS Assistant Regional Manager, 40 George Street, South Grafton NSW 2461 Northern Region Office, NSW Gov't Offices, 49 Victoria St, PO Box 97, Grafton NSW 2460 066 420 591 w, 066 425 706 h, 066 420 619 fx 'Wave Hill Station' Homestead, Sue Tucker and Steve Ibbott, Carnham Creek Road, Fine Flower Creek 2460 Ph 066 472 145 Mr John Whitehouse, Adviser, Sve (Beach 17 Mawson Street, St Ives NSW 2075 02 233 3622 w, 02 449 7151 h, Mr Bruce Woolf, Solicitor, Woolf Associates, 10th Floor, 82 Elizabeth Street, Sydney 2000 02 221 8522 w, 02 371 6015 h, 02 223 3530 fx Please Note: (*) denotes professional government service officers. They are not retained to advise, but may be or have been subpoenaed. Their presence on this list does not imply any further relationship with the case.

JOINT SCIENTIFIC COMMITTEE REPORT CRITIQUES

Australian Heritage Commission
 Possinghom & Norton
 Kirle Patricle Gr ACF
 CSIRO Wildlife & Ecology
 NSW NPUS CODA System
 Earthworn "Aug I
 Earthworn "Aug 8
 Cambora Times - Computer Bug

(i) Resource Assessment Commission Inquiry into Forest and Timber Resources

(ii) Joint Scientific Committee on South East Forests

(iii) Feasability studies into Eucalypt Plantations

(iv) Flitchmill feasibility study

(v) Value adding manufacture

(vi) Better utilisation of smallwood.

None of these studies have been commissioned by the FCNSW. If any of the feasibility studies prove to be worthwhile, then it is apparent that for many years the FCNSW has been depriving local industry of value adding procedures and improved availability of resource. This is particularly so of the sawmill industry which has faced a series of quota cutbacks, so that a sustained yield production of sawlogs can take place, while the woodchip industry has become dominant in terms of timber utilisation.

No need to log National Estate areas

The following table demonstrates that logging areas outside National Estate areas will sustain the current timber industry for at least two years. Areas referred to are contained in the FCNSW EIS, 1990 Appendix 4. and timber volumes obtained from HDA-EIS, 1986 thus:

Average pulpwood yield : 100 tonnes/ha

Average sawlog yield :

Α.

12

Eden Working Circle9.9 m3/haBega Working Circle21.4 m3/haBombala Working Circle30.3 m3/ha

Harvesting	<u>Area</u>	Cone	e_Area_(ha)		Pulpwoo	<u>d</u> +	Sawlog_((<u>m3)</u>
1			107		10700		2140	
2			1876		187600		37520	
3			99		9900		1980	
4			315		31500		6300	
5			598 .		59800		11960	
Б	•		593		59300		11860	
7			23		2300		460	
8			300		30000		6000	
9			-		· _		-	
10			454		45400		9080	
11			207		0		4140	
12			663		66300		5967	
13			490 .		49000		9800	
14			179		17900		1511	
15			21		2100		189	
16	EXCLUDED	9/21	Compartment	s Na	tional E	sta	:e	
17			115		11500		1045	
17a			155		15500		1395	

18		2400		240000	21600
19		2009		200900	18081
20		528		52800	11760
21	EXCLUDED	4/26 Comp	artments N	ational Est	tate
22	EXCLUDED	- NATIO	NAL ESTATE		
23	EXCLUDED	- NATIO	NAL ESTATE		
24	EXCLUDED	- NATIO	NAL ESTATE		1
25	EXCLUDED	- NATIO	NAL ESTATE		
26		300		15000	
27		1495		75000	7500
28	EXCLUDED	- NATIO	NAL ESTATE		
			_		· · · · ·
LS		12927	ha	1182500 🕂 pulpwood	170278 m3 sawlogs

TOTALS

Even if areas that aren't suited to wet weather logging are excluded (180100 4 pulpwood and 32660 m3 sawlogs) the industry is still well catered for outside National Estate areas. Operations will still be well dispersed if logging occurs in the above areas.

total

The west area proposed for logging is about 3 times the area expected to be logged. Consequently logging need not occur in National Estate areas. The South-East Forest Alliance has identified up to 20 years supply of woodchips and 10 years sawlogs outside listed National Estate areas. This is under current logging and processing procedures. It is apparent even if National Estate areas are logged, and without restructuring of the sawmilling industry that a possible shortfall of sawlogs will occur from about the year 2005, as from after the year 200 the sawlog component will come increasingly from thinned regrowth stands. The Commission has little information available at present to demonstrate that regrowth timber from the current operation will be suitable for the sawmill industry.

B. <u>Utilisation of Available Resources</u>

There is a growing body of evidence to suggest that full use of timber logged isn't taking place in the Eden Management Area, and as such places pressure of the resource available in sensitive, high ecological value forests of the escarpment.

The NSW Pulp and Paper Industry Task Force Report states (p.37) "...the full productive potential of State Forest is often not achieved due to lack of funds for the necessary silvicultural operations to thin out regrowth stands and to remove competing defective stems" and recommends "the Forestry Commission seek increased productivity in prime production native forest areas through more intensive silvicultural regimes". The Report in its estimates of available resources included wood that "is currently left to waste on the forest floor". Tasmanian studies identified in the HDAEIS 1986

а.

would be severely restricted on these sites and they were excluded from the survey. Eight compartments which contained recently logged coupes were systematically selected for intensive sampling. These 8 covered the range of major forest types within the ENFMA.

Data was collected from coupes within each of the 3 Forestry Commission Districts within the ENFMA.

Eden District Jingera Section Waalima Section

Compartments 657, 658 Compartment 372

Compartment 1761

Bombala District Rockton Section Coolangubra Section

Bega District Glenbog Section Compartments 2428, 2386

Compartments 1323, 1311

A total area of 61.3 hectares was intensively sampled

To enable the collection of the maximum amount of information in the limited time available, sampling with Probability Proportional to Prediction (or 3P sampling) was employed. This sampling methodology is widely used for the estimation of standing forest volume and it was specifically adapted for this task. Johnson (1972) provides a useful introduction to the subject

With 3P sampling, the probability that an individual piece is selected for detailed measurement is not constant as in simple random sampling, but is in proportion to the estimated volume of the piece. Hence, with simple random sampling the weight given to each measured individual is the inverse of the sampling rate and with 3P the weight applied is inversely proportional to the estimate of volume for the measured piece.

3.3. Survey Results

The volume of 12,330 individual pieces was estimated and detailed measurements made of the dimensions of a total of 630 pieces. Plannining and specification of data collection, data processing and preliminary analysis were undertaken by Forfront Pty Ltd.

Table 3.2 - Residues as a percentage of volume already removed.													
	Dry Sclerophyll Sites					Wet Sclerophyll Sites							
	-	Compartm	ent			Compartment							
Area Logged (ha)	657	658 63.3	372 · 44.4	1761	1311	1323 32 0	2428 87.0	238	6				

Mean

102

108

9.2

4.7

4.0

17.9

8.6%

4.3%

3.7%

2312

7116

9428

309

410

100.5

13.7

1.3

14.1

29.1

3.3%

0.3%

3.4%

4283

7708

11991

241

375

13.0

15.6

21.2

49.8

3.5%

4.2%

5.7%

139

2057

11811

13868

(136

:159

23.6

5.5

4.0

7.3

16.8

3.4%

2.5%

4.6%

420

2722

3142

_1i3D

131

10.8

8.1

19.7

8.3%

6.2%

0.6%

0.8 :

17.5

Mean

200

269

10.7

. 7.3

10.9

28.8

4.0%

2.7%

4.0%

Attack Columbia

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NOTES: For the purpose of this analysis, it is assumed that 1 cubic metre = 1 tonne.

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Sawlog (cubic metres)

Pulpwood (tonnes)

Total

E Pulpwood per ha

Total per ha

(cubic metres per ha.) Small

Large

Dry

Total

Residues as % of total cut Small

Large

Dry

Residues

153

2623

2776

78

82

5.6

2.7

2.8

11.2

6.9%

3.3%

3.4%

4.6

289

5526

5815

87

92

4.6

8.2

5.9

3.0

17:0

8.9%

6.4%

3.2%

244

5509

5753

124

130

5.5

11.7

8.5

3.1

23.3

9.0%

6.6%

2.4%

262

2949

3211

118

128

10.S

11.4

1.6

7.2

20.2

8.9%

1.2%

5.6%

Table 4.3 (a)

Estimated Volume to be harvested and Estimated Recoverable Residue 1990-1994

Section	Sawlog	Pulpwood	DRY WOOD	SMALL	WOOD L	ARGE WOOD	
	•	· •	0		Ò	. 0	
Nadgee	0	0	Ő	•	0	· 0	
Fast Boyd	0	U	0	•	Ô	0	
Timbillica	0	· 0	. 0	•	. 0	0	
Allan Brook	0	0	. 0		4 200	4.300	
Waalimma	11,800	99,700	U		4,300	13 100	
Vuramie	30,900	305,100	0		13,100	3 600	
Lennarde	6.200	85 ₄ 500	0		3,000	26,000	
Leilliarus	53,500	635,300	, 0		26,900	20,500	
Faikhei	42 500	481,700	0		. 20,400	20,400	
Jingera	42,500	1944 B. B.		· : : : : : : : : : : : : : : : : : : :	-	0	
		0	. 0		0	. 1 200	
Mumbulla	1 800	32,200	. 0		1,300	1,300	
Quaama	1,000	0	0	• •	: 0 ::	· 0	
Doranook	.0 ()		÷÷ 0	· ·	<u></u> 0	0	
Glenbog	. 0	40.000	0	•	2,800	2,800	
Verona	30,700	40,000			-		· C
	•	0	. 0	•	0	· 0	
Bondi	. 0	000.000	0		9,200	9,200	
Rockton	36,000	200,000	7 900		4.000	. 5,300	
Coolangubra ⁹	29,100	190,900	2 900	<u></u>	1,900	2,500	
Cathcart ^e	14,800	90,600	000 00	_	10,000	13,400	
Pericoe ²	41,600	514,700	20,000		10,000	·	
		•		•	97 500	102.800	
TOTAL.	298,900	2,675,700	31,700		10500	20560	
per annum	59780	535140	0.340		17500		

NOTES:

The scheduled sawlog and pulpwood cuts tabulated are derived from aggregation of Tables 3.3 & 3.4 from the NSWFC EIS (1983)

^e identifies those Sections which are assumed to constin predominantly wet sclerophyll forest types.

The following percentages of total scheduled cut are assumed to be recoverable from existing residues to yield a final residue level of 7 cubic metres per hectare.

• •	Dry Wood	Small Wood	Large Wood
Wet Sclerophyll	90.0%	45.0%	90.0%
	0.0%	45.0%	90.0%

Assuming the surveyed sites are reasonably representative of the ENFMA, application of the proposed recoverable percentages above to the proportions of residue to actual cut in Table 3.2 yields the following percentages of actual cut which might be recoverable as additional pulpwood.

	Dry Wood	Small Wood	Large Wood
	2 606	1.8%	2.4 10
Wet Sclerophyll	5.0 %		2 0.9%
D- Selerophyll	0.0%	3.9%	5.5 10
I ITV SCICIOUIIVII	VIV · V		

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New South Wales Government

Forestry Commission of N.S.W

Mr Sid Walker Conservation Council of the SE Region and Canberra (Inc) GPO BOX 1875 CANBERRA ACT 2601 AUSTRALIA

95-99 York Street Synergy Is S.W. Box 2667 G.P.O. Sydney N.S W 2001

Telex, Forcom 21657

<u> San selecence:</u>

Currofacence: 6090 D.I.HAMILTON: MM Faregonade, 2004 1 516

3rd October 1990

Dear Mr Walker,

I refer to your letter of 16 September 1990 concerning timber resources of the Eden Management Area, addressed to Dr Drielsma. Please find herewith the information you require by management Section, as at 1.1.1990. Also enclosed is a copy of Map 5A

(north and south) of the 1990 EIS showing the state of logging disturbance, also to 1.1.1990. I note your request for information concerning sawlog percent. This should not be necessary for your purpose as the quantities of both sawlogs and pulpwood available for harvest are provided.

The relevant average royalties for the half-year to 30.6.90 are:

Docwqluq \$15.59 sawlogs \$30.02

Yours sincerely

R.A. NIMMO Acting Secretary

Per:

EDEN MANAGEMENT AREA

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TIMBER RESOURCE - 1/01/90 (not including regrowth after logging)

	Cut 1			Cut 2			Total			
	Area	s'logs	p'wood	Area	s'logs	p'wood	Area	s'logs	p'4000	
SECTION	(ha)	(m ³ G)	(t)	(ha)	(m ³ G)	(t)	(ha)	(m°G)	(t)	
<u>Bombela</u>						-			·	
Bondi	155	515	14539	751	9093	88198	906	9608	102737	
Rockton	2:177	27821	291202	3858	40286	447315	6335	68107	738517	
Coolangubra	2989	53195	417369	3794	67777	520441	6783	120972	93781(
Pericce	4547	69246	464728	4344	76343	458063	8891	145589	922793	
SUB TOTAL	10168	150777	1187838	12747	193499	1514017	22915	344276	2701855	
Eden										
Falkner	8095	64318	733920	11973	96975	1086420	20068	616793	1820340	
Timbillica	196	1516	17327	6893	45927	603333	7089	47443	620660	
East Boyd	746	1493	29180	2151	3838	69240	2897	5331	98420	
Nadgee	120	720	72000	3718	24588	236268	3838	25308	30826	
Lennards	1407	4555	85898	2244	7552	137674	3651	12107	22357	
Allan Brook	95	1425	11400	4265	52617	436296	4360	54042	447696	
Waalimma	1664	18622	170888	7515	87218	807985	9179	105840	97887	
Jingera	7341	46418	491788	9587	54890	663919	16928	101308	115570	
Yurammie	3592	33481	329398	5610	55098	534208	9202	88579	86360	
SUB TOTAL	23256	173048	1941799	53956	428703	4575343	77212	601751	6517142	
Bega				 						
Mumbulla	2615	5961	33885	3044	26988	149804	5659	32949	183689	
Quaama	2189	7655	80105	4143	12427	195345	6332	20082	27545(
Ooranock	94	500	5000	94	500	5000	188	1000	10000	
Verona	584	3850	28000	584	3850	28000	1168	7700	5600	
Glenbog	6290	166152	928975	12035	317587	1676172	18325	483739	260514	
SUB TOTAL	11772	184118	1075965	19900	361352	2054321	31672	545470	3130230	
GRAND TOTAL	45196	507943	4205602	86603	983554	8143681	131799	1491497	1234923	
xpected		11	93	A	11	94	<u>. </u>	11	•	

Yield/ha

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ont), herdouring non the second secon

tant physiological determinants of their separate occurrence on gully bottoms and adjacent slopes respectively. Comparison of dry-country and wet-country forms of both seeds and seedlings of blackwood indicate a distint clinal variation within the species.

The effect of thinning on the growth of mountain ash (*Eucalyptus regnans* F. v M.) in Victoria

Arthur W. F. Webb

Master of Science in Forestry, University of Melbourne, 1966.

The response of stands thinned at varying ages and to varying intensities was established using data from a series of 22 permanent plots established and thinned in 1947 in stands then aged 8, 21, 25, 36 and 42 years.

The response to thinning was found to be significantly correlated with initial tree basal area, age when thinned, and basal area retained after thinning. However, while the response was significant, its magnitude was small. Growth prediction formulae are presented for given numbers of stems of largest diameter per acre. The data for gross basal area indicated that thinning, within normal limits, had no effect on gross basal area increment. Thinning also had no effect on height growth. Crowns responded to thinning by increased branch extension. Root spread of dominant trees aged 40 years was approximately double the crown spread and, while root fusion occurred in a wide range of age classes, it was not sufficient to be solely responsible for reclamation of the site following thinning.

The thin bark of mountain ash was easily damaged durin ming, allowing decay and brown staining to affect data and retained stems. Losses sustained because of damage (decay, etc.) were outweighed by the value of wood removed as thinnings. Damage sustained in commercial thinning was within economic limits and was tolerable.

Master of Science in Forestry, University of Melbourne, 1969

The spatial arrangement of regrowth stems in a mixed eucalypt foothill forest was examined. The age of the overwood was estimate to be about 80 years and the age of the regrowth resulting from past selective logging of the overwood was about 18 years.

Stepwise multiple regression analysis was used to determine which competitive factors amongst those included in the analysis appeared to be most important in affecting the pattern of regrowth observed. The four factors selected by the analysis as most important were:

Forestry

traina.

- Distance to the nearest overwood tree; distance and size of nearest overwood stump; and variation in the
- micro-relief of the soil surface.
 Of these factors, the distance to nearest overwood tree was most significant. The influence was shown to extend well outside the area vertically beneath the tree crowns of the live overwood trees.

The selection of size and proximity of overwood stumps in the analysis was attributed mainly to the existence of a zone of reduced competition around stumps following the death of the root system of the overwood trees following felling.

The inclusion of micro-relief in the analysis was considered to be largely due to the effect of depressions in the soil surface. These have resulted in the accumulation of organic matter and the collection of soil moisture in hollows to provide favourable moisture environments in time of summer drought.

The effect of the overwood was further demonstrated in growth studies over a period of about three years. The diameter increment of dominant stems of regrowth was over 50 per cent greater following removal of the overwood compared with a similar stand which had the overwood retained.

The investigation of the likely cause of the distribution of regrowth observed in the field generally supported the working hypothesis made at the outset of such studies that water availability was the main factor responsible. However results of pot trials in the glasshouse also indicated that differences in light intensity of the order encountered in the forest, and variations in nutrient levels (nitrogen and phosphorus) had important effects on seedling growth both individually and in combination. Interactions between light, nutrients and moisture availability were considered to exist under forest conditions. During these investigations it was noted that an excess of any one of the three factors of light, nitrogen or phosphorus resulted in a reduction in growth. This aspect warrants further investigation.

Results of these same pot trials in relation to a study of the different effects of the various levels of light intensity, nitrogen and phosphorus on lignotuber size in relation to seedling size, indicated that both nitrogen and phosphorus had marked effects. Light intensities of the order investigated (15% to 100% of full sunlight) appeared to have negligible effects. However investigations using light intensities of lower levels than those examined together with better control of temperature and moisture availability are desired before light can be discounted. These results have indicated that at least some environmental changes can influence lignotuber development apart from the indirect effects caused by changes in seedling size.

Results of the studies also indicate that adequate new regeneration can be obtained to supplement the stockings of established lignotuberous seedlings by clearfelling of the overwood without special measures taken to prepare a seed bed.

Vol. 52, No. 3, 198

Density and basal area sampling techniques for contagiously distributed trees: studies in a dry sclerophyll forest

Walter E. Westman

Master of Science, Macquarie University, NSW, 1969

Sampling techniques providing unbiased estimates of density and basal area were sought for use in forest stands containing aggregated populations of Eucalyptus near Sydney, Australia, A total of ten acres of dry sclerophyli forest in the Ku-ring-gai Chase, a National Park north of Sydney, were mapped to a scale of 1" = 10' using plane tabling techniques. These maps were the basis for subsequent testing of various sampling techniques. The mapped stands have been analysed by the pattern analysis technique of Greig-Smith and results applied both toward interpreting the results of density sampling techniques tested, and toward understanding the structure and dynamics of the forest stands. Sampling methods proposed to date for use with contagious distributions are extensively reviewed, including a survey of more than 16 mathematical models of contagion from a number of fields of study. Both theoretical and empirical considerations show that such general sampling techniques for contagious distributions as McIntyre's line transect method, Aberdeen's aggregation circles method, and Morisita's angle-order method can not provide reliable density estimates in all aggregated populations. Further analysis indicates that the latter two methods may provide useful estimates when modified to apply to plants distributed by particular patterns of contagion. A plotless, systematic sampling technique was developed in the course of this investigation which is specifically designed for use with individuals distributed by known models of contagion at known scales. The technique is shown capable of providing density estimates of less than 10% error both in an artificial contagious population of Eucalyptus gummiferer, application of the method to individuals of unknown distribution may necessitate two phases of sampling. The thesis also discusses pertinent ecological characteristics of the genus Eucelyptus in dry sclerophyll forests of Australia, with special attention to possible origins of patterns of contagion in eucalypt communities.

Work studies of cutting in radiata pine David Whiteley

Master of Science, Australian National University, 1973

Two work studies of radiata pine cutting were undertaken to show how they can help solve some typical logging problems. The first study compared alternative methods of logging first thinnings in plantations near Bathurst, New South Wales. A regression equation for the mean cutting time per tree was calculated from time study data on present shortwood operations at Bathurst and applied to data on sample plots first thinned in 1965-1970 to es-

Jayoe Bega


nal University, 1976

tative regrowth and uring the first two ommunities in dry A.C.T.

ation prior to burneeds in the soil and ing communities in species invaded the

te of three modes of ative regrowth alone, ad the remainder by rmination. Both the regetative growth and re greatest during the

ly commenced shoot of burning. Both the nent of growth were ons (creating water rigin of the regenerarts on plant growth. occurred.

vaceous species by seed ed reserves in the soil stion and lethal heatcalyptus species, seed ng provided the source tions.

tion of most species 's and/or by removing hibited germination in

tring the first year after is died while still in the monly observed causes ingal disease, and pre-

by fire-induced changes oted scaling establishwere the ght to include is present in the unburnt lity, and improved soil

r burning was examined f secondary succession. and after a survey of the aber of different vegetaurning, it was concluded unities after disturbance attal Floristic Composi-



tion model. When a community is disturbed by agents other than fire, which impose different stress conditions on the species present and different constraints on the early stages of revegetation, the process of regeneration would not be expected to conform to the same model as that described for fire.

Some effects of the burning of vegetation on soil nitrogen transformations

Robert John Raison

Doctor of Philosophy, University of New England, 1976

There is a lack of information on the effects of fire on soil biological processes, related nutrient cycling and soil fertility. In the field it is difficult to isolate the cause of changes in soil nitrogen (N) parameters after burning, because the effects of heat, ash and modified microclimate are confounded. Consequently, procedures were developed to stimulate the range of ash and heat levels generated in vegetation fires, and to establish in the laboratory their effects on soil chemistry, soil biological activity and some transformations of organic and fertiliser N.

The activity of the enzyme urease, which is of basic and major importance in terrestrial N cycling, was used as an estimate of biological activity in the two contrasting soils (podzolic and krasnozem) employed for the studies. Rates of soil respiration and of accumulation of mineral N were also used as indices of soil microbial activity.

Burning of vegetation results in production of volatile, deposited and partly H_2O -soluble (ash) and airsuspended substances. Volatilisation of C and N from plant residues increases with the degree of combustion, and more than a 90% loss from graminaceous straws can occur when combustion is virtually complete. The composition of deposited ash depends on the chemical composition of the burned residue and the degree of combustion (burning conditions). Ash derived from graminaceous straws possessed only about 5-15% of the alkalising power of CaCO₃.

The amounts of ash deposited in grass fires increased soil pH and altered respiration rates of both soils. In sandy podzolic soil metabolic activity was increased, but in the more buffered krasnozem soil high levels of ash slightly decreased respiration rate, while small amounts had no effect. These trends were found to be due to the effects of alkalinity *per se*, the small amounts of organic carbon (O.C.) contained in the ashes and to changes in the solubility in H₂O of soil O.C. Ash did not stimulate respiration rate in steam sterilised podzolic soil indicating that pH rise was insufficient to cause any chemical oxidation of organic matter and that ash acts via its influence on soil biological populations.

In both soils, treatment with either heat or ash increased accumulation of NH₄-N. However, the mode of action

Rustralian Forsty: Vol. 52, No. 3, 1989.

of the two amendments was different. Heating of soil led to immediate liberation of NH₄-N, resulting from the chemical oxidation of organic N compounds, as well as increased mineralisation during subsequent incubation. The amount of NH₄-N formed increased with both the intensity of heating and the organic matter content of the soil. Ash stimulated ammonifying organisms and decomposition of organic matter, leading to accumulation of NH₄-N during incubation of the soils.

Heat and ash interacted to significantly increase accumulation of NH₄-N in both soils during incubation. Heat appeared to increase the solubility of soil organic matter, making it more readily decomposed under conditions of higher pH in the presence of ash. The large increases in the availability of mineral N, particularly after severe soil heating, would contribute to the stimulated plant productivity often observed after vegetation fires. Nitrification was negligible in both soils irrespective of treatment.

Deposition of ash tends to increase volatilisation of NH, derived from NH₄-N forming fertilisers (urea, (NH₄)₂SO₄), while soil heating reduces the rate of urea hydrolysis but has little influence on other soil properties affecting volatilisation of NH₃. The reasons for the above effects of heat and ash are discussed and related to fertiliser management practices in agriculture and forestry.

The potential effect of fire on the N economy and dynamics of ecosystems are summarised and their implications for the long term management of several agricultural systems discussed.

Doctor of Philosophy, Australian-National University, 1978

The aim of the study was to develop a suitable economic model of wood production for application to landuse planning situations particularly in regions where forestry is already, or could be, prominently featured and where large areas of marginal farmland exist. The Lower South Coast was adopted as the Region on which to base the model.

The investigation was divided into two parts; Part I, a comparative analysis of farming and forestry in the Region; and Part II, development of a linear programming model for the identification of the optimal set of strategies for wood production from the Region.

The analyses were based on the principles of cost-benefit analysis and the criterion used was the present value of net social benefits. The social rate of discount was estimated to lie somewhere between 4 and 6 per cent with 5 per cent the most likely value. Shadow prices were also computed for the various sources of capital. They were estimated to be \$3.62, \$2.73 and \$2.19 per dollar for loan funds at 4, 5 and 6 percent discount rate respectively and \$1 per dollar for other sources of capital.

The comparative analysis in Part I showed that about 130 000 hectares of farmland were available for softwood planting of which some 70 000 hectares were considered to be marginal. Forestry in the form of radiata pine plantations was found to be more economic than farming, irrespective of the assumptions relating to prices, costs and yields and regardless of the discount rate used. The production of sawlogs rather than pulpwood represented the most economic strategy for radiata pine plantations.

In Part II, two models were developed, one (designated model R1) based essentially on existing plans for wood production from the Region including softwood planting on Crown lands in the Bombala Sub-District and the other (designated model R2) which proposed shifting planting entirely to the farmland. The two models were treated as mutually exclusive proposals. It was established that the native forests were more than capable of meeting industry commitments over the 50-year planning horizon adopted and there appeared to be grounds for increasing these commitments. In general, strategies of lowest intensity were only required in these forests.

The present value of net social benefits for model RI was \$9.7 million greater than that for model R2, suggesting that the proposed programme of planting on Crown lands in the Bombala Sub-District is to be preferred to the conversion of marginal farmland. This difference was magnified when the annual planting rate on the farmland in model R2 was reduced to a level comparable with that proposed for the Bombala plantations.

The principal bone of contention in accepting these results relates to the opportunity cost of the native forests to be cleared for planting in model R1, since it did not incorporate higher net social benefits resulting from recreational, aesthetic preservation and/or scientific uses. Therefore, there is a possibility that the present value for model R1 is overstated and that for model R2 is understated. However, the difference in the present values between the two models seems likely to outweigh any revisions of opportunity cost for the native forests to be cleared for planting in model R1.

The two models can be used to evaluate other policy issues — in particular, some reduction in the scale of the two planting programmes proposed and integration of them.

Studies on stand structure and stand dynamics of even-aged stands with particular reference to *Pinus radiata* plantations

Ahi Bhusan Rudra

Doctor of Philosophy, University of Melbourne, 1972

Current trends in the end uses of timber show that there are many outlets for various assortments of timber, for

which there has hitherto been no market. The assessment of timber resources in terms of specific sizes and classes, will therefore, receive greater attention as estimates of multiple product yields become necessary for sound management decisions.

The aim of the study is to analyse methods of characterisation and prediction of stand structure for treated and untreated stands. A detailed multivariate analysis is made to show the relationship of simple stand parameters and the attributes of the distribution of individuals in a stand. A new approach is also made in studying the effect of stand structure *per se* on the growth of a stand.

Stand structure is examined in terms of the pattern of disribution of size classes, and that of the spatial disposition of individuals in an even-aged plantation. The study of the association amongst individuals provides specifications for the allocation of individuals to the various planting locations and thus leading to plausible approximations of spatial pattern.

Accurate estimation of increment under varying conditions is a sine qua non for the solution of problems connected with the prediction of the distribution of size classes through time, and due to a specific treatment. Growth determinants and discriminants are analysed and related to readily measurable tree and stand parameters. Growth models are formulated for the study of stand dynamics.

The rationale for the projection of stand structure is discussed. The results of simulation studies of stand structure due to different patterns of early thinnings are presented. Systematic or row thinnings are compared with selection from below thinnings.

Although the study has been mainly confined to *Pinus* radiata plantations of the A.P.M. Forests Pty. Ltd., the techniques and implications set out, should have a much wider application.

Fungal-termite associations in the natural resistance of selected eucalypt timbers

David Bamulimbya Abooki Ruyooka

Doctor of Philosophy, Australian National University, 1978

The natural resistance of Eucalyptus regnans F. Muell., E. delegatensis R.T. Bak., E. camaldulensis Dehnh. and E. acmenioides Schau. was tested by exposing blocks to the termine species Coptotermes lacteus (Froggatt) and Nasutitermes exitiosus (Hill).

The presence of variations in the natural resistance of wood was also comprehensively investigated under laboratory and field conditions to determine if there were significant, quantitative differences in

1) Eucalyptus regnans, E. grandis W. Hill ex Maiden, E. camaldulensis, E. acmenioides, and E. wandoo Blakely;



Australian Forestry

sampling and analysis, the development of appropriate large scale survey procedures and their application toward the recognition of community types using classification and ordination techniques. Approximately 1000 species assessed on 1500 sites were organised into thirty eight community types and their distribution mapped at a scale of 1:100 000. Part two considers the relationships between community types, their composition, structure and where possible, the factors which influence their distribution.

Initial separation of data was achieved with a monothetic divisive classification. The relationships between classes were examined further by principal co-ordinate analysis. This made possible the objective reallocation of sites between classes on polythetic basis, so that the members of any one group of sites bear greater overall similarity to each other than to the members of any other group. Final groups were considered to represent community types. Their diversity and the eveness of species distribution amongst sites was compared using the Shannon-Weaver Information statistic.

Genetic selection criteria in Pinus radiata *

J.N. Cosco

Master of Science, Australian National University, 1970

The potentials of crown variables for increasing productivity are investigated for *Pinus radiata*. Genetic data are based on a twelve-year-old progeny trial containing twelve controlled-crossed families. Sampling is restricted to the dominant and codominant crown classes to minimise competitional effects. Heritability estimates and genotypic and phenotypic correlations are derived for eleven crown characteristics and four productivity variables. The crown traits are branch diameter, branch length, branch angle, number of branches per foot, number of branches per whorl, number of whorls per foot, crown length, crown radius, crown length-to-width ratio, crown surface area, and crown volume. The productivity variables are diameter at breast height, total volume, basal area increment, and volume per acre.

Selection indices for productivity per acre are constructed from these data. One series of indices are based on genetic information alone, and another series include 'reasonable' estimates of economic values for crown traits. The efficiency of the selection indices is assessed from the expected genetic gain in productivity which is compared with the gain anticipated from selection for productivity alone. The indices are tested on the family means to detect which type of tree the indices favour.

Narrow sense heritability estimates indicate branch and whorl frequency variables have high breeding values, unit branch characters are moderately genetically controlled, and crown dimension traits have low heritabilities. Productivity variables have the lowest breeding values. Genotypic and phenotypic correlations derived from

components of variance and covariance show that most crown traits are strongly related to productivity per acre. Improving productivity through correlated response to selection for crown traits is genetically feasible.

Selection indices based on volume per acre and crown traits such as number of whorls per foot, number of branches per whorl, crown length-to-width ratio, and crown radius estimate a three- to four-fold improvement in productivity per acre can be achieved in comparison with selection for volume per acre alone. Incorporating economic values in the index does not greatly alter the relative index weights or expected advance.

Testing the indices on the family means shows the majority select the type of trees having narrow, multinodal crowns with a good length-to-width ratio combined with a moderate stem volume.

Crown traits are shown to play a significant role in the whole tree concept. Breeding programmes must place more emphasis on evaluation of crown attributes to achieve a maximum yield of useable wood.

Studies on problems of regeneration of Eucalyptus regnans in Tasmania

K. W. Cremer

Master of Science, University of Tasmania, 1964

The ecological relationship between rainforest and eucalypts is reviewed.

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- Effects of fire on seed-trees. If much humus is burnt in contact with the tree's butt, the tree is likely to be girdled and thus killed, even if its bark is thick. When the fruit capsule is killed, either because the tree is girdled or because the supporting twig is scorched, the capsule dries out and then sheds its seed. Death of capsules is prompt after scorching, but may be delayed for many months after girdling. Fire may also greatly accelerate the abscission of capsules (and hence the shedding of seeds) from unscorched crowns. As the immature flowering stages may also be abscised or killed because of fire, only the mature seed held on the tree at the time of burning can be relied on for natural regeneration while the seedbed is still receptive (1-2 years after burning).
 - Covering seed with soil: In a pot trial, the seedlings that emerged as a percentage of viable seeds sown on crumbly soil was: 51% for seed sown under 1/4 inch of soil, 16-18% on the surface and under 1/2 inch, and 0-2% under greater depths. Emergence from under highly compacted soil was 1% under 1/4 inch, and nil under greater depths.
 - Daily and annual patterns of shoot elongation are described, and the latter were related directly to weekly mean maximum temperatures.
 - Browsing by native possums and wallabies retards seedlings and kills many, if defoliation is complete. A single, complete defoliation by hand during February

Abstracts of Masters Theses

to June killed many 6-18 inch tall *E regnans* seedlings, but defoliation during August-December was relatively harmlesss to survival and growth. The season of defoliation was similarly important with seedlings of *Pomaderris apetala* and *Acacia dealbata*,

- The results of some sowing, planting and fertilising experiments are given.
- There is a detailed description of the mechanisms that operate to release seed from within the capsule as this dries out.
- Dispersal of seed was best in the direction of the prevailing winds. Distance of dissemination depended on degree of exposure to wind. Dissemination sufficient for natural regeneration was restricted to distances equal to about 1 to 1½ times the height of the isolated parent trees.
- Most of the seed shed is destroyed by insects: mainly by the bug *Euander lacertosus*. Pelleting with DDT, TMTD and latex gave useful but not incomplete protection
- The early stages of plant succession after burning are described in detail, especially those of the mosses and liverworts which covered 99% of the ground 11/2 years after burning.

Factors associated with the ashbed effect in *Pinus radiata* plantations

Robin Neil Cromer

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Master of Science in Forestry, University of Melbourne, 1970

The practice of clearing the native eucalypt forest and heaping the debris into windrows and burning them creates "ashbed" sites. Seedlings of *Pinus radiata* (D. Don) planted in these ashbed sites often exhibit dramatically superior growth compared with those planted in adjacent unburnt sites. This comparatively superior growth is commonly termed the "ashbed effect".

The major factors involved in the ashbed effect were examined and an attempt made to rank them in order of importance. An attempt was also made to reproduce the ushbed effect by artificial means in the field. The study was divided into two sections.

In the first section, ashbeds of various ages and adjacent bays were examined for differences in nutrient status and growth of *P. radiata*. It was found that trees growing on the ashbeds gain an early time lead of 18 months to 2 years over trees in the bays after which their rate of growth becomes parallel. Trees in the ashbeds had a higher concentration of nutrients in their foliage than rees in the bays, but this difference diminished with age. Soil from the ashbed sites contained a higher total concentration of the major nutrients than soil from the bays. In the second section the major factors were examined individually and experiments were set out in the glasshouse and the field to test the effect of each on the growth of *P. radiata*. The addition of ash to pots of soil produced an increase in the growth of *P. radiata* and had the effect of a fertiliser which contained phosphorus and potassium but little nitrogen.

The effect of heating soil on subsequent growth was dependent on the temperature of treatment. Heating above $200 \,^\circ C$ was detrimental to growth but heating which simulated ashbed conditions improved the growth of *P. radiata*.

Temperatures recorded in soil under a burning windrow showed that the top $1\frac{1}{2}$ inches was heated to over 200°. The temperatures reached in the $1\frac{1}{2}$ to 3 inch layer were between 100°C and 200°C and those in the 3 to 12 inch layer were between 50°C and 100°C.

The greater part of the early root growth takes place in the 3 to 12 inch layer of soil but the temperatures recorded at this depth would do little more than partially sterilise the soil. Simulation of this treatment by chemical sterilisation of soil in the field produced spectacular increases in growth and slightly increased the concentration of nitrogen in the foliage. The addition of inorganic fertilisers to the sterilised soil produced some additional growth and substantially increased the concentration of nutrients in the foliage. The growth of *P. radiata* in artificially sterilised and fertilised plots exceeded that in nearby ashbeds.

It is suggested that the major factor which contributes to the increase in growth is the stimulation of roots by the elimination of suppressing organisms, competitors and pathogens in the layer of soil from 3 to 12 inches deep. Large increases in the total amount and the availability of most nutrients is considered to be a major, but secondary factor in the ashbed effect.

Regeneration of river red gum *Eucalyptus* camaldulensis Dehn.

Barrie Donald Dexter

Master of Science in Forestry, University of Melbourne, 1970

The aims of this study were to investigate the main factors influencing the regeneration of river red gum *Eucalyptus camaldulensis* Dehn., in Barmah forest and to use the results to develop procedures for establishing regeneration primarily for wood production.

Factors influencing germination and survival of seedlings were examined. These included seed supply, seasonal conditions, seed beds, availability of soil moisture, the influence of over-topping trees, flooding and grazing.

Natural seed supply is variable because the intensity of flowering varies widely and unpredictably from year to year and about 45 per cent of flowers fail to mature. Seasonal conditions are a major factor affecting germination of seed and survival of seedlings especially in the absence of flooding. On unflooded areas germination is confined to the wetter, cooler months and survival is highest if there are good summer rains. Germination and

SOUTH EAST FORESTS OF NEW SOUTH WALES

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AN ANALYSIE OF WOOD RESOURCE ISSUES IN CONTEXT OF SECTION 30 OBLIGATIONS UNDER THE AUSTRALIAN HERITAGE COMMISSION ACT.

ATTACHMENT

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DEPARTMENT OF PRIMARY INDUSTRIES AND ENERGY CANBERRA MAY 1989

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SOUTH EAST, FORMETS OF NSW (Second States of States)

INTRODUCTION

The purpose of this report is to consider the obligations flowing from Section 30 of the Australian Heritage Commission Act 1975 in the context of the Commonwealth's consideration of export-related forest operations in the national estate areas of the South East Forests of NSW.

Section 30 requires the Minister for Resources to determine whether forest operations under a proposal requiring the Commonwealth's approval will adversely affect the national estate values of the place to a significant extent; if the adverse effect is significant, the Minister must determine whether there are prudent and feasible alternatives; if there are no alternatives, the Minister is required to ensure that measures are taken to minimise any adverse effect.

2 COMMONWEALTH PROPOSAL

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The national estate areas comprise Coolangubra, Tantawangalo and Yowaka places which are regarded as significant by the Austrelian Heritage Commission, predominantly for their range of biological values.

From an industry viewpoint, in order to maintain supplies to local sawmills, particularly Bombala, the NSW Government has taken the view that logging operations in Coolangubra and Yowaka national estate areas are necessary. Logging and road construction activities began in January 1989 and are continuing. In the Tantawangalo national estate area, which is important as a water supply catchment for local townships, the NSW Government proposes to conduct operations as part of a hydrological research trial over the next five years. This will involve limited logging (81 hectares) for 3 compartments in Tantawangalo and subsequent monitoring work for the next five years.

The Minister for Resources, taking account of the environmental advice provided by the Minister for Arts, Sport, Environment, Tourism and Territories, has developed a proposal for interim arrangements which would allow detailed biological studies to proceed while maintaining essential resource supplies to the local sawmills. Overall, the proposal involves continued logging of about 9 per cent or 4981 hectares of a total of 54,716 hectares in the NE areas of the Eden Management Area. The 9 per cent figure does not include those national parks included in the national estate. If the parks are counted, the proposal involves continued logging in 6 per cent of the national estate. Further the Commonwealth proposal confines the current logging activity in national estate to discrete areas to maximise the opportunity for studies in other areas.

The proposal is set out below and is charted in the attached maps.

COOLANGUBRA NATIONAL ESTATE (35,000 HECTARES)

of the State Forests within the National Estate but outside the Nalbaugh and Nungatta national parks logging would be confined to three distinct somes in the Rockton area, white Rock River area and in a further area of North Coolangubra. Within those areas, which comprise some 10% of the NE place, compartments where logging could proceed are broadly contiguous. Under the proposal:

-: 4

(1) the area where logging would be deferred subject to biological studies would cover some 90%

- (11) the area where logging could continue for duration of biological studies but in accordance with increased environmental protection measures would cover some 10%.

In addition, the proposal would include agreement for the construction of Wog Way Road.

YOWAKA NATIONAL ESTATE (10,000 HECTARES)

Of the State Forest within Yoweka

- the area where logging would be deferred subject to biological studies would cover 86% (1)·. ·.
- (ii) the area where logging could continue for the duration of biological studies but in accordance with increased environmental protection measures would cover 14%. Similar to the situation in Coolangubre, the areas for proposed continued cutting in Yowaka comprise four discrete groups of compartments as shown on the attached mapa.

TANTAWANGALO NATIONAL ESTATE (9,716 HECTARES)

Of the 9,716 hectares of State Forest within the Tantawangalo national estate, <u>81 hactares, (less than) per cent)</u> of this national estate place would be logged as part of hydrological research work planned by NGWFC.

The experiments proposed are confined to three compartments and would be conducted over a 5 year experimental period. Limited salvage operations to extract windblown timber would also be allowed. Mapping detail is at Attachment A.

PRUDENT AND FEASIBLE ALTERNATIVES 3

3.1 Coolangubra and Youaka

In view of the extent of logging activity which has taken place since January 1989 and the wood required to maintain sawlog supplies for the proposed 12 month period of biological studies, the extent of logging in Coolangubra and Yowaka NE places under the proposal by the Minister for Resources could be considered to have a significant effect on NE values.

To determine whether there are prudent and feasible alternatives to logging in these national estate places for the 12 months duration of the biological studies, annual industry resource requirements and the legislative and operational constraints to resource access in the Eden Management Area are examined below.

3.2 Tantawangalo

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In the Tantawangalo national estate place, limited trial logging (lass than 1 per cent of the national estate place) to facilitate hydrological studies for the next five years is not considered to have a significant effect within the meaning of Section 30 of the Australian Haritage Act (1975). The logging is part of an established experimental program in which \$750,000 has already been invested through construction of weirs for testing stations. The research is designed to establish whether or not logging in the Tantawangalo Water Eupply Catchment would significantly adversely affect water quality and quantity. . Water supplies for the towns of Candelo, Wolumia; Pambula and Merimbula are drawn from Tantawangalo Creek, which also contributes to water for Begs and Tathra as well as substantial rural irrigation. The proposed cutting does not constitute a routine commercial logging operation and the proposed experimental operations would preclude any commercial logging in the area at least for the 5 year study period.

3.2.1 Industry Hood Requirements

Cutting of the existing wood must be conducted against the background of the sustainable yield calculations which have been articulated in the Commonwealth and State EIS processes.

Saimill Industry

The rate of all timber cutting in the Eden Management Area is determined by the NSW Forestry Commission's estimates of sustainable sawlog supply. This establishes the total sawlog allocation in the Area, and thus, the consequential supply of pulpwood made available by integrated cutting operations. This reflects the assentially sawlog-driven nature of forest operations in the area.

The annual sustainable sawlog allocation of <u>67,000 cubic metres</u> from State Forests in the Eden Management Area is distributed between five sawmills with Bombala, Eden and Nimmitabel receiving the majority allocations.

The allocation of sawloge from particular areas to particular sawmills is arrived at by balancing the availability of roading in logging areas (limited by road-weather conditions) and proximity of operations to sawmills. Each sawmill is served from forest areas which are located closest to that sawmill.

E

Limited sawlog volumes (around 4,000 cubic metres per annum) become evailable from privately hold timber reserves in the Eden region. The State Government does not have control over private property wood resources. Sawlog availability on private property is, essentially, an opportunistic resource and is depandent on the pulpwood operations of Harris Daishowa.

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The privately held wood is already part of the industry throughput and in the longer term does not constitute an additional resource to the sawmill industry. By seeking a higher cutting rate from privately held timber areas in the short term some marginal sawlog yield could feasibly become available but constraints and time lags imposed by the commercial contractual process would limit this significantly.

Pulprood Industry

The woodchip mill owned by Harris Daishowa (Australia) Fty Ltd at Eden receives its annual sustainable allocation of 530,000 tonnes Crown pulpwood. It draws this roundwood from within the Edon Management Area. Pulpwood from within the Agreement area accounts for two thirds of its total woodchip operations. Some pulpwood is also obtained in conjunction with normal sawlog operations from Crown forests outside the Agreement These are sawled only operations and the amount of pulpwood available from head and butt salvage varies and is limited by the NSWEC's intention to reduce sawlog yields from these forests to susteinable levels wherever possible. As the cut of sewlog is reduced so too is the pulpwood that can be salvaged from the operations.

The extent to which pulpwood can be supplied from privets property is also governed by transport costs relative to price peid for resource. Present cost structures permit logging up to 250km from the Eden mill. The privately held wood is already part of the pulpwood industry throughput and in the longer term, does not constitute additional volumes. seaking a private property higher cutting rate in the short term, some marginal pulpwood yield may be feasible although constraints and time lags imposed by the commercial contractual process would limit this significantly.

3.3 Constraints to industry access to wood requirements

Logicistion 3.3.1

In his judgement on the Jarasius case, Justice Hemmings said "the preparation and assessment of an environmental impact statement is not compelled by Section 112 [of the EP&A Act] unless the carrying out of the activity is likely to significantly affect the environment" and that the activities of the FCNSW were "likely to significantly affect the environment within the meaning of Section 112".

Under Section 111, the FCN5W must "examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment" in considering, inter alia,

the issuing of timber licences. In addition, the BCNSW, in Hemmings view, is required to consult with the Director of Planning on any such activity.

The opinion of the Australian Government Solicitor is that any authorization of operations <u>additional to those specified in</u> the State EIS would constitute a breach of/Section 112 of the EP&A Act; such (additional) operations would require <u>full</u> <u>consideration</u>, under Section 111 of the Act. Thus, the alteration of working circle distribution of activities is constrained by and limited to the 201 compartments delineated in the State EIS.

3.3.2 <u>Operational Constraints</u>

The outting areas included in the State EIS for the 1988-89 period include 336 individual coupes applying the alternate coupe system and 22 involving sawlog operations with head and butt salvage. The total net cutting area, as identified in Appendix 4 to the State EIS, is about three times the total net area required for logging in 1989. The volumes additional to the alternate annual crown out serves as a buffer to wet weather and fire which have the potential to restrict greatly the wood availability in any one year.

In the period since January 1989, planned cutting and roading operations have been severely constrained by unusually wet weather conditions. These conditions on the average to highly prodible soils have limited the wood available to industry.

5.4 Wood Availability

Legislative end operational constraints affecting wood availability have been taken into account in preparing calculations of the <u>available wood</u> from compartments outside and inside national estate.

To determine wood availability <u>outside</u> national estate, it was determined that wood <u>is available</u> where

- . logging has started but is restricted to driver portions of the compartments such as upslope areas and ridges
- . logging hes not yet commanded but compartment is recorved for winter logging.

and not available where

- logging has been completed
- . logging has been abandoned due to wet weather
- . logging hes not commenced due to wet weather
 - logging has not commenced due to wet conditions but, if it did, it would be restricted to the ridges

there, is currently no access roading is the manual of

compartment will form part of a Flora Reserve.

Concerning wood evailability inside netional estate, it was determined that wood is available whore

- · · · · · · logging has started but is restricted to drier portions of the compartments such as ridges .
 - logging has not yet commenced but compartment is reserved for winter logging ...
- compartment contains research plots (Tantawanglo)
-
- compartment is scheduled for 1989 (Ccolangubra)
- 1 Logging has been undertaken in these compartments since January/February and it has been estimated that for Coolengubre 80% of the 1989 resource remains whilst in Yowaka 85% of the 1989 resource is available under the Commonwealth Plan.

Nood is not evailable where:

- logging has been completed
- logging has been abandoned due to wet weather
- logging has not commenced due to wet weather
- logging has not commenced due to wet conditions but, if it did, it would be restricted to the ridges
- there is currently no access roading
- compartment will form part of a Flore Reserve.

Nocd outside national estate 3.4.1

60,000 m3

The wood volumes indicate that in the Bombala District, the svallable wood is 1,522 cubic metres of sawlog and 9,556 tonnes of pulpwood. For the Eden District, 8,364 cubic metres of sewlog and 75,276 tonnes of pulpwood are available whilst in the Bega District, 7,076 cubic metres of sawlog*and 34,940 tonnes of pulpwood are available. Therefore, the total wood currently available to industry outside of national estate for the remainder of the State EIS period (until December 1989) is 16,962 cubic metres of sawlog and 119,772 tonnes of pulpwood. This resource is available from all compartments identified in the State EIS which are accossible.

Wood inside national estate which is currently being 3.4.2 leaged or proposed for logging under the proposal by the Minister for Resources.

In the Coolangubra national estate place, 11,664 cubic metres of sawlog and 68,016 tonnes of pulpwood are available. For

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Yowaka, 5,959 cubic mattes of &&wlog and 53,659 tonnes of pulpwood are available whilst in Tantawangalo, the logging as part of the hydrological research experiments will make while available 2,430 cubic metres of sawlog and 12,150 tonnes of pulpwood.

51.

The total wood currently available for industry under the proposal inside of national estate for the remainder of the State EIS period is 20,053 cubic metres of sawlog and 133,825 tonnes of pulpwood.

3.4.3 <u>Available wood in context of ramsining allowable cut</u> for 1989

As noted above, the annual allowable cut on a sustainable basis from State Forest in the Eden Management Area is 67,000 oubic metres of sawlog and 530,000 tonnes of pulpwood. The proportion of allowable cut utilised to date, on a pro rata basis, is 38 per cent. The <u>remaining allowable cut</u> is therefore 41,540 cubic metres of sawlog and 328,600 tonnes of pulpwood.

Comparing the wood data from sections 3.4.1 and 3.4.2 of this report with the remaining allowable cut, the sawlog and pulpwood supply and demand is as follows:

	Avgliability			Zemainico		
	Outside NE	Incide NE	Total	Allovable Cut	Volume/ Weight	_* _*
favlog (cubic metree)	16,962	20,053	37,015	41,540	4,525	11
Pulpwood (tornea	119,772	133,825	253,597	328,600	78,003	23

This indicates that there is insufficient wood currently available <u>outside</u> national estate to mast industry requirements for the semainder of the period covered by the State EIS. Even taking the volumes <u>inside and outside national estate together</u> there is a 11% shortfall in Sawlog availability with a corresponding shortfall of 23% in pulpwood evailability. (The uneven shortfall result as between sewlog and pulpwood availability reflects the yield relationship between these two Categories within the compartments effected by both access constraints and proposed logging deferrals.) In summary, on the basis of the above calculations of wood volumes currently available to industry, without some logging within National Estate areas, it would not be possible to continue supplies to the industry at its present level of activity and employment. Accordingly, it is concluded that, in order to prevent employment loss, there would be no prudent or feasible alternative at this time to a proposal which included some cutting in National Estate places.

3.4.4 Implications for sawmills

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The allocation of sawlogs from particular press to sawmills is discussed above. Sawmills serviced by the Eden Management Area are located in Bombala, Nimmitabel, Eden, Narcoma and Moruya. They receive allocations in the proportions indicated below.

.

Sowmill	Porcentage of Total Input	Area of supply (Working Circle)
Bombala Nimmitabal Iden Harooma Moruya	39 17 36 2	Bombala Bombala, Eden and Bega Eden Bega Eden
	100	

Both Sombala and Nimmitabel sawmills draw wood from the Bombala and Bega Working circles. This has important implications for logging in the Coclangubra national estate area.

6evmill	Annuel Quoța	Remaining Quote	Kood Av within Work Outside NZ	milable ing Cirole Inside NE	Shortfall
-Eombala	26,130	16,200	8,598	-14,094	569
Minnitabel	11,390	7,061			
TOTAL	37,520	23,261	. 22,6	92	869

Note: All figures are sculog volumes expressed as cubic metres.

This resource enalysis indicates that there is a 369 cubic metres shortfall which represents around 4% of the remaining quota for the 1989 pariod.

On the whole, however, provided access to compartments remains constant and does not deteriorate it could be said that the Minister for Resources' proposal for National Estate areas should enable sawlog supplies to be maintained.

4 OTHER SOURCES OF WOOD WHICH HAVE BEEN SUGGESTED AS ALTERNATIVE SUPPLY

The South East Forest Alliance (SEFA) hes suggested that there is sufficient sawlog and pulpwood volumes available to permit the reservation of Tantawangalo, Coolangubra and Yowaka

SEFA has identified five sources of additional pulpwood in the context of its national parks proposition including logging and Victoris; private property, thinnings beyond the year 2000; Management Area.

The additional pulpwood sources have been analysed. The volume identified by SETA are essentially pulpwood and not sawlog wood and cannot be considered as an additional volume to offset any new parks proposal as integrated logging is <u>sawlog driven</u> and not pulpwood driven. In wood terms, the pulpwood industry benefits through an increase in the pulpwood resource but the sawmilling industry is unchanged as increased utilisation does not produce sawlog material.

5 MEASURES TO MINIMISE THE ADVERSE EFFECT ON NATIONAL ESTATE . VALUES

In view of the findings that, under the Commonwealth plan, there are no prudent or feasible alternatives to logging in the national estate, Section 30 of the AHC Act requires measures to be prescribed to minimise the adverse effect. The forestry management prescriptions set out below would minimise the effect of current and proposed logging in the national estate.

- .(i) in recognition of the importance of streamside and wildlife corridors for non-wood values in the Eden area, they are to be increased from 40 metres to 80 metres in Catchments greater than 100ha and linked into national parks and flors reserves where appropriate
- (11) in view of the average to high erodibility of the granite soils in the Eden area, roading to be restricted to ridgelines where practicable and in accordance with the protection of visual values
- (iii) no roading in areas reserved for further biological studies

(iv) regrowth retention logging and regeneration treatments to the NSW be applied wherever practicable

no logging in swamp forest or box-ironbark woodland as defined by NDWS panding a review of the reservation status of these forest types

(iv) to take account of the diversity of fauna in the Eden area, increased prelogging studies to identify and protect significant faunal values. Ander States and Anderson and And

6 CONCLUSION

(v)

The statutory obligations imposed by Section 30 of the Australian Heritage Commission Act on Commonwealth Ministers and authorities making decisions which may adversely affect a place that is part of the national estate are examined in this

It concludes, on the basis of sustainable yield cutting requirements for the ENFMA, and taking account of ourrent operational and legal constraints on alternative wood supplies, that operations within national estate areas are unavoidable.

The Commonwealth proposal described in Section 2 of this report takes into account the environmental advice provided by the Minister for the Arts, Sport, the Environment, Tourism and Territories and proposes interim arrangements which would allow detailed biological studies to proceed while maintaining essential resource supplies to the local sawmills.

The initiating clause (3) of Section 30 first requires the identification that en action might affect a national estate area to a eignificant extent. In the Tantawangalo national estate place, limited trial logging (lass than 1 per cent of the national estate place) to facilitate hydrological studies is not considered to have a significant adverse effect within the terms of Section 30 of the Heritage Act.

In Coolangubra and Yowaka, in view of the extent of logging activity since January 1989 and the volumes required to maintain sawlog supplies for the period of the proposed biological studies, the extent of logging under the proposal by the Minister for Rescurces could be considered to have a significant effect within the terms of Section 30 of the

Where significant adverse effects are identified, Section 30(1) requires the Minister to satisfy himself that there are no prudent and feasible alternatives to taking that action.

Prudent and feasible resource alternatives to logging in Coolangubra and Yowaka have been examined. The examination considered the annual volumes of wood required by the industry in order to maintain activity and employment (under sustainable cut) and the legislative and operational constraints to access

13

The legislative constraints to industry access in the Eden Management Area restrict wood availability from State Forest to order NSW law. The total volumes identified in the EIS is approximately three times the total net area required for cut serves as a buffer against wet weather and fire which have the potential to severely constrain wood availability in any

The operational constraints imposed by the unseasonal wet weather pattern have severally restricted wood availability. The total volumes currently available to industry <u>outside</u> <u>national estate</u> for the remainder of the State EIS period (until December 1989) is 16,962 oubic metres of sawlog and 119,772 tonnes of pulpwood. These volumes are available from 70 compartments, which are accessible to varying degrees, out of a total of 201 compartments identified in the State EIS.

The total wood availability inside national estate in Coolangubra, Yowaka and Tantawangalo national estate places currently being logged and those proposed for logging under the proposal is 20,053 cubic metres of sawlog and 133,825 tonnes of pulpwood.

The available volumes in context of <u>remaining allowable cut for</u> <u>1989</u> is 41,540 cubic metres of sawlog and 328,600 tonnes (<u>sustainabla</u>) of pulpwood. In terms of prudent and feasible alternative resource to meet requirements at the industry's current level of activity and employment for the remainder of 1989, there is insufficient resource outside national estate.

That is, industry wood requirement for the remainder of 1989 is 41,540 cubic matres of sawlog and 328,600 tonnes of pulpwood whereas only 16,962 cubic metres of sawlog and 119,772 tonnes of pulpwood is currently available <u>outside of national estate</u>. Accordingly, the utilization of wood volumes outside of national estate is not judged to provide a current feasible alternative to no logging in the national estate.

Under the access constraints currently imposed by the racent unseasonal wet weather, it is concluded that when wood outside national estate is combined with the wood inside national estate covered by the proposal from the Minister for Resources, there is still a 11% shertfall from planned allowable cut in sawlog and 23% shortfall in pulpwood volumes. The greatest impact will be felt at the Bombala and Nimmitabel sawmills where there will be a 4% shortfall for the remainder of 1989 during the second half 1989. Provided access improves after should enable sawlog supplies to be maintained.

Our examination of the issue in accordance with Section 30(1) thus indicates that there are no current prudent and feasible alternatives to logging in the national estate.

Where this is found to be the case, Section 30(1) further requires that the Minister must be satisfied that all measures that can reasonably be taken to minimize the advarse effects will be taken. Accordingly, additional forestry management national estate values. The measures are considered to be adequate and accommodate the major national estate values of the verious national estate places affected.

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The Parliament of the Commonwealth of Australia

Joint Committee on Foreign Affairs, Defence and Trade

A Review of Australia's Efforts to Promote and Protect Human Rights

December 1992

Australian Covernment Publishing Service Canberra

JUBMISSIONS

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•	56.	Australia-Burma Council/ National Coalition Government for the Union of Burma
<b>F</b>	57.	The Uniting Church Centre, Rev Richard Wootton
	58.	The Uniting Church Centre, Rev Richard Wootton (Supplementary to Submission No 57).
	<b>59</b> .	Mr Hugh Wood
	60.	Austcare, Ms Patricia Garcia
Ī	61.	The Hon John Dowd, QC, International Commission of Jurists
	62.	Mr Malcolm R Gracie, International Commission of Juriste
•	63.	Amnesty International, Mr Harris van Beek (Supplementary to Submission No 33)
	<b>64</b> .	Hon. E G Whitlam, AO, QC (Supplementary to Submission No 51).
	65.	Attorney General's Department
	<b>66</b> .	Chinese Alliance for Democracy
25	67.	Overseas Services Bureau (Supplementary to Submission No 30)
	68.	Ms Lyndal & Sophie Barry on behalf of the National Coalition Government for the Union of Burma and The All Burma Students Democratic Front
ų.	69.	Dr David Pfanner Bask International (Supplementary to Submission No 20)
	70.	State of Palestine Palestine Liberation Organisation (Supplementary to Submission No 45)
	71.	Mr Helmi Fauzi on behalf Indonesia National Youth Front (FPN) & the Indonesian Forum for Human Dignity (INFOHD)
	72.	Palestine Human Rights Campaign (Supplementary to Sub No 40)
-	73.	Australia/South Africa Training Trust

74.	Wen Jin Chen, Feng Ye
75.	Department of Foreign Affairs and Trade (Supplementary to Submission No 1)
<b>76</b> .	Attorney-Generals Department (Supplementary to Submission No 65)
77.	Department of Foreign Affairs and Trade (Supplementary to Submission No 1)
78.	Ms Rosemarie Gillespie
79.	AIDAB (Supplementary to Submission No 1)
80.	Sakyamuni Buddhist Centre Venerable Thich Quang Ba
81.	Department of Immigration, Local Government and Ethnic Affairs (Supplementary to Submission No 48)
82.	Serbian National Federation in Australia
<b>83</b> .	Vietnam Committee on Human Rights
84.	Ms Rosemarie Gillespie (Supplementary to Submission No 78)
85.	Department of Foreign Affairs and Trade (Supplementary to Submission No 1)
86.	Department of Defence
87.	Australia Israel Publications (Supplementary to Submission No 9)
88.	Department of Foreign Affairs and Trade (Supplementry to Submission No 1)
89.	Confidential

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Mr Andrew Kovesdy	President, Hungarian Human
-	Foundation of Victoria
Mr Alan John Matheson	International Officer.
	Australian Council of Trade
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SYDNEY THURSDAY, 23 APRIL 1992

Convenor, International Mr Robert Gordon Christie Relations Committee, New South Wales Young Labor Campaign Director, Amnesty **Mr Andre Frankovits** International Australia. Director, Sydney Office, Mr Jeremy Jones Australia/Israel Publications (Private), Jingili, NT Mr Dennis Dewey Schulz National Director, Amnesty Mr Harris van Beek **International Australia** Policy Adviser to the Chief Mr Roger John Walker Executive, World Vision Australia SYDNEY FRIDAY, 24 APRIL 1992 Chairman, Australian Catholic **Bishop William Brennan** Social Justice Council Chairman, Council, Australian Hon John Robert Arthur Dowd, AO QC Section. International Commission of Jurists Justice Elizabeth Andreas Evatt. AO (Private) Paddington, NSW Convener, Subcommittee Mr Malcolm Reeves Gracie (Burma), International Commission of Jurists Australian Section President, Committee Mr Victor-Hugo Munoz for Human Rights in Guatemala Secretary, Committee for Mr Lachlan James Murdoch Human Rights in Guatemala Co-representative, Australia-Mr Philip Edward Smyth Burma Council and National Coalition Government of the Union of Burma Hon Edward Gough Whitlam, AO, QC (Private), Potts Point, NSW Representative, National Mrs Amanda Zappla Coalition Government of the Union of Burma and Australia-Burma Council

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### CANBERRA THURSDAY, 14 MAY 1992

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		Department of Immigration.
		Local Government and Ethnic
		Affairs
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	Misa Sonhie Barry	(Private), Hawthorn, VIC
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	Mr Laurence Kenneth Bugden	Ass Sec. Refugee, Asylum &
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	Mi Helliy Durmawa	Attorney-General's Dent
	Mr Douglas Stuart Campbell	(Private), Hawker, ACT
	Ma Datricia Carrie	Project Coordinator
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	Mr Robert John Home	A/g Director Anylum Section
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		Branch, DILGEA
	Me Sue Ingrem	Ass Sec. Compliance Branch.
	Me oue merall	DILGEA
	Dr. Graham Richard Kearns	Ass Sec. Strategic Policy &
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	Mr Groham Albert Mowhrey	Advisor Human Rights.
	Mi Glanan Albert Mowordy	Attorney-General's Dept
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	All Collinionore Drendan Donald C Doginin	Strategy & Concepts.
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Intal Policy Dvsn, Dept of Defence CANBERRA THURSDAY, 28 MAY 1992 Ass Sec, South-East and South Mr Kevin James Boreham Asia Branch, DFAT First Ass Sec, Asia Dvsn, Mr Peter Charles Grey DFAT First Ass Sec, Intnl Orgns & Ms Penny Wensley Legal Dvsn, DFAT CANBERRA TUESDAY, 16 JUNE 1992 Human Rights Commissioner, Mr Brian Edwin Burdekin Human Rights and Equal **Opportunity** Commission Executive Assistant, Human Ms Rana Flowers **Rights and Equal Opportunity** Commission Senior Policy Adviser, Human Mr David Mason **Rights and Equal Opportunity** Commission CANBERRA THURSDAY, 25 JUNE 1992 Leader, Palang Dharma Party, Major-General Chamlong Srimuang Thailand 127

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#### **APPENDIX 3**

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### LIST OF EXHIBITS

- 1. Massacre at Santa Cruz. Video-Australian Media Reports -Dili supplied by ACFOA.
- 2. Video Lateline, A Current Affair, Win News & ABC News: supplied by the Parliamentary Library media coverage of the events in Dili on 18/11/91.
- Father Renato's Video: events after the massacre in Dili, supplied by Bill Nelson at DFAT.
- 4. The Right to Intervene in the Domestic Affairs of States. a paper written by Gary Klintworth, Senior Research Fellow Northeast Asia Program, Australian National University.
- 5. Statement of the K W I The Indonesian Bishops Conference on the East Timor Incident: supplied by Pat Walsh-ACFOA-
- 6. Photographs and Map of Dili: The crowd of mourners moving to the cemetery in Dili, supplied by Mr Bob Muntz.
- 7. Tape: AM 18-11-91 East Timor, supplied by Micah, Parliamentary Library.
- Amnesty International Report on Indonesia/East Timor. AI Index: ASA 21/26/91
- 9. East Timor The Santa Cruz Massacre: Paper from International Secretariat - Amnesty International -
- 10. Amnesty International Report: East Timor After the Massacre -
- 11. Australian Red Cross Society News Release: East Timor incident
- 12. Univs: List of victims of Dili massacre supplied by Father Frank Brennan SJ.
- 13. ACFOA Report on the Disturbance in East Timor. Speech made by Commander-in-chief of the armed forces, and a list of the members of the commission of inquiry.
- 14. Bishop's Committee for Justice Development and Peace: Media Release by the Australian Catholic Social Justice Council.

- 15. Resolution on the East Timor massacre: by the European Parliament, from the Embassy of Portugal.
- UN Resolutions 1975-82: Research Paper by Bill Standish on UN activities in the 1980's on East Timor.
- 17. The Santa Cruz massacre: What is to be done? A paper from Pat Walsh at ACFOA.
- East Timor: an Indonesian Socio-Anthropological Study by Prof Dr Mubyarto, Dr Loekman Soetrisno et.al.
- 19. Texts of Testimony: by Rt Rev and Mrs Paul Moore, Allan Nairn and Amy Goodman to a hearing of the United State Congress Human Rights Caucus on 26 November 1991.
- The Dhein Massacre, Slavery in the Sudan: Human Rights Abuses in the Sudan 1987 by Ushari Ahmed Mahmud & Suleyman Ali Baldo.
- Human Rights Violations in Sudan: Video Massacre in Bor, Kongor and Mongalla, Nov 1991. Mass exodus of children from Southern Sudan 1990. Khartoum Government's obstruction of relief operations in Southern Sudan May 1991.
- 22. Racism and Antisemitism in Australia during 1991: an overview of developments by ACTU.
- 23. ILO Conventions ratified by Australia: from the ACTU.
- 24. Asia Watch: US Senate C'tee Hearings Amnesty International USA; from Embassy of Portugal
- 25. The Middle East, Islam and Human Rights: Background Paper No. 2 from the Dept Parliamentary Library.
- 26. The Optional Protocol: The Practical Issues. paper from Attorney-General's Department.
- 27. Australia and the Righting of an Injustice to Israel and the Jewish People. from the Zionist Federation of Australia.
- 28. The Public/Private Distinction and the Right to Development in International Law: by Dr Hilary Charlesworth.
- 29. Press Release:

- 30. Unity No 21, December 1991: a newspaper of the United Nations Association of Australia.
- 31. Unity No 22, January 1992: a newspaper of the United Nations Association of Australia.
- 32. Unity No 23, February 1992: a newspaper of the United Nations Association of Australia.
- 33. Economic and Social Council: United Nations report from Embassy of Portugal.
- 34. Letter, paper and News release: recording the Indonesian Government's response to the Dili massacre, from Senator The Hon G Evans, QC.
- 35. Notes on an interview with Otto Ondawame: a West Irian Refugee.
- 36. Report on the atrocities committed by the Burma Army 30 August, 1989. from Kachin Independence Organisation.
- 37. Sudan Update: SRRA/FACE Foundation, from Mr Mariano Ngor
- 38. Sinhalese backlash: Far Eastern Economic Review, from Australasian Federation of Tamil Associations.
- 39. Jaffna Teachers Union-Tamils in Sri Lanka an Appeal from a Dying Nation: a letter supplied by the Australasian Federation of Tamil Associations.
- 40. A collection of press clippings: from the Australasian Federation of Tamil Associations.
- 41. Protection Denied: continuing Israeli Human Rights Violations in the Occupied Palestinian Territories 1990. supplied by Palestine Liberation Organisation.
- 42. A collection of press clippings: from Palestine Liberation Organisation
- 43. A collection of papers from Al-Hag. from Palestine Liberation Organisation
- 44. Tibetan New Year Festival: from Australian Campaign for Tibet Inc.
- 45. Burmese Refugees in Thailand: by Therese M Caouette supplied by Training and Environmental Awareness for the Karen People.
- 46. Countdown to 1997: report of a Mission to Hong Kong from the International Commission of Jurists

47. Human Rights in Guatemala 1991: report elaborated and published with support and collaboration of the World Council of Churches, supplied by Mr Lachlan Murdoch of the Committee for Human Rights in Guatemala.

48. The Burmese Way: To Where?: report of a Mission to Myanmar (Burma) on behalf of the International Commission of Jurists, Mr Malcolm Gracie.

- 49. Overseas Burma Liberation Front from The Australia-Burma Council National Coalition Government for the Union of Burma
- 50. Protecting Children's Rights under the UN Convention: The Alicia Johnson Memorial Lecture, Darwin, 11 October 1991. by Justice Elizabeth Evatt, AO.
- 51. Eliminating Discrimination against Women: a paper by Justice Elizabeth Evatt, AO December 1991.
- 52. On an Equal Footing: a report by the provisional Human Rights and Foreign Policy Advisory Committee of the Netherlands, supplied by Amnesty International.
- 53. Five Booklets relating to Human Rights abuses in Jammu and Kashmir. provided by the Indian High Commission
- 54. Government Response to the JCFADT Review of AIDAB & the Aid Program: from Robert McKinnon, International Policy & Ministerial Services Section AIDAB.
- 55. Address to Amnesty International on "Human Rights and Australian Foreign Policy: by Dr John Hewson.
- 56. A collection of documents on International Human Rights: from the Parliamentary Library.

57. Further information on Burms: The SLORC Cannot be Trusted: from Mr Hugh Wood, Spokesperson on Burma, W A Division, Australian Democrats.

- 58. Release all Political Prisoners. Stop Human Rights Violations in Burma: from Reverend Richard Wootton
- 59. Humanitarian Intervention Morally right, Legally wrong?: written by Dr Hugh Smith, a Senior Lecturer, ADFA.

60. The Barefoot Student Army: video on Human Rights Atrocities along Burma Thailand Border, produced and supplied by Lyndal and Sophie Barry

- 61. ILO Conventions Ratified by Australia as at May 1992: supplied by Mr Alan Matheson ACTU
- 62. Creating Facts: Israel, Palestinians and the West Bank, by Geoffrey Aronson Human Rights Issues Post Madrid: Undercover Killings in 1991 Reveals Israel's Shoot to Kill Policy: Palestine Human Rights Information Centre Separated Palestine Families Tell Their Stories: Al Haq. BTselem: Limitations on the Right to Demonstrate and Protest in the Territories BTselem: The Interrogation of Palestinians during the INTIFADA A collection of press clippings: supplied by Mr Ali Kazak of the PLO.
- 63. Australian Controls on the Export of Defence and Related Goods. Guidelines for Exporters, supplied by Department of Defence.
- 64. Submission to the Foreign Affairs Inquiry: from Australia/West Papua Association.
- 65. Colonial History (British and Sinhala): supplied by Mr Ravi Chandra Australasian Federation of Tamil Associations.
- 66. The New World Order Redefining Refugees: a report on three Asian Refugee Trouble Spots written by Justice Marcus Einfeld Australians Caring for Refugees Worldwide: Refugee Week Committee: a collection of media releases.
- 67. News photographs of the 1st Anniversary of the NCGUB: supplied by Amanda Zappia Australia-Burma Council/National Coalition Government for the Union of Burma
- 68. A collection of various articles on Human Rights violations in Vietnam: A letter re. Investigation to the Persecution of Buddhists in Vietnam: Death Penalty: by Amnesty International An Appeal by the Unified Buddhist Church of Vietnam for the Protection of Human Rights in the Socialist Republic of Vietnam: Documents on the violation of the right for freedom on worship in Vietnam A collection of Press clippings: relating to Human Rights violations in Vietnam Various letters to Parliamentarians: Parliamentary papers: on Vietnam
- 69. Set of the Procedure Advice Manuals on Refugee and Special Humanitarian Programs: supplied by DILGEA.
- 70. Human Rights Defender's Manual 1992: Diplomacy Training Program Ltd written and supplied by John Scott Murphy

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- Canadian Human Rights Mission to Sri Lanks: supplied by Mr Ravichandra, 71. Federation of Tamil Associations
- East Timor Independence Committee: a letter to all Caucus Members from 72. Ines Almeida

Human Rights in Developing Countries and the link to Development 73. Assistance - Research and Administrative Programme 1988. by The Danish Center for Human Rights Dutch Human Rights and Foreign Policy Advisory Committee - Development

Cooperation and Human Rights: supplied by Amnesty International

Yugoslavia Mistreatment of Ethnic Albanians: a case study - a report by 74. Physicians for Human Rights and the Johannes Wier Foundation March 1991 Yugoslavia - Ethnic Albanians - Victims of torture and ill-treatment by police in Kosova province: Amnesty International. A collection of articles on Kosova: supplied by Mr Sezar Jakupi, Albanian

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### CHARTER OF THE UNITED NATIONS

#### PREAMBLE

### WE THE PEOPLES OF THE UNITED NATIONS DETERMINED

- to save succeeding generations from the scourge of war, which twice in our lifetime has brought untold sorrow to mankind, and
- to reaffirm faith in fundamental human rights, in the dignity and worth of the human person, in the equal rights of men and women and of nations large and small, and
- to establish conditions under which justice and respect for the obligations arising from treaties and other sources of international law can be maintained, and
- to promote social progress and better standards of life in larger freedom,

### AND FOR THESE NEEDS

to practice tolerance and live together in peace with one another as good neighbours, and

to unite our strength to maintain international peace and security, and to ensure, by the acceptance of principles and the institution of methods, that armed force shall not be used, save in the common interest, and

to employ international machinery for the promotion of the economic and social advancement of all peoples.

### HAVE RESOLVED TO COMBINE OUR EFFORTS TO ACCOMPLISH THESE AIMS.

Accordingly, our respective Governments, through representatives assembled in the city of San Francisco, who have exhibited their full powers found to be in good and due form, have agreed to the present Charter of the United Nations and do hereby establish an international organization to be known as the **United Nations.** 

### CHAPTER 1. PURPOSES AND PRINCIPLES

#### Article 1

The Purposes of the United Nations are:

To maintain international peace and security, and to that end: to take 1. effective collective measures for the prevention and removal of threats to the peace, and for the suppression of acts of aggression or other breaches of the peace, and to

# A Response to the Environmental Impact Statement (EIS) on Forestry Operations In The Eden Management Area For 1991 from the Tantawangalo Catchment Protection Association (TCPA).

### INTRODUCTION

Before commenting on matters of detail, this response examines several of the assertions made in the EIS which form the basis for the conclusion that logging operations "can be carried out within acceptable standards of environmental impact, with no demonstrable long term significant damage to ecosystem viability or productivity, or to other values of significance." (EIS page 4)

The two major deficiencies of the EIS are its subjectivity and its highly selective use of material to support its conclusions.

The EIS relies heavily on the Joint Scientific Committee (JSC) for its credibility and quotes the Committee's conclusion that it found "no scientific evidence to indicate that current management practices will result in the extinction of any organism, either plant or animal." (EIS page 28)

This particular conclusion has been dismissed by a large section of the scientific community involved in environmental sciences, as a value judgement rather than a valid scientific conclusion. Indeed the consensus among those scientists who have received media coverage is that such an assertion is highly misleading. Moreover while absolute conclusions on species extinction cannot be made one way or the other, it is clear that the Forestry Commission's management practices increase the probability that numbers of species will become extinct because populations will inevitably be reduced and fragmented.

Similarly the EIS, in its comments on invertebrates (page 47), quotes the JSC finding that "it saw no reason to believe that an integrated system of ecological reserves, coupled with sympathetic forest management practices, would not be an effective regional conservation strategy for those animals." Given that the available data on invertebrates in the south-east forests is almost non-existent, we consider such a finding to be both highly misleading and subjective.

It is important that these deficiencies in scientific method displayed by the JSC and enthusiastically taken up in the EIS are debated now so that they do not assume the status of axioms. Furthermore, reliance placed on JSC methodology is ques-

tionable given Mr Lee Belpin's exposure of climatic distortions caused by a bug in the computer software.

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> Not surprisingly, the EIS is dismissive of the Australian Museum Report in a manner that borders on the gratuitous. The EIS (page 30) dismisses the major conclusion of the Museum Report that "logging brings about essentially permanent changes in the distributions and abundances of plants and animals and destroys wilderness values," with the assertion that while the latter is <u>probably</u> correct, the contention regarding permanent change is arguable as "the changes produced by logging are well within the order of change produced by natural occurrences such as wildfire and windstorm." (page 31)

> This latter assertion is indicative of a basic lack of understanding of the impact of current management practices under which the Forestry Commission has been labouring for many years. Put simply, logging constitutes an additional impact to wildfire and windstorm rather than an alternative. Forests which are logged still have to contend with fire and storm and the overlay effect of logging cannot simply be dismissed as an equivalent impact.

> Apart from its overall subjectivity, the EIS can be criticised for its selective use of and in some cases outright omission of material. An example of the latter is in the information the EIS provides on the 173 kms of additional roading planned for the Eden Management Area. Whilst we are advised (page 24) that "the provision of an extensive road system as part of forestry activity is a positive approach to reducing the damage to the environment caused by wildfire," there is no mention of the environmental impact of such roading facilitating the influx of noxious weeds and feral animals. Our concern at what we understand to be an almost total absence of Forestry Commission research into the environmental impact of roading is highlighted by the number of scientists with whom the TCPA has had contact who consider the impact of roading on the ecosystem to be as great as the logging itself.

> The significance of a poor data base needs to be addressed. There is a whole range of organisms likely to be affected by current forestry practices. The following list is not exhaustive:

- the effects of repeated soil disturbance and compaction on soil micro-organisms
- the effect on higher organisms in the food chain which depend directly and indirectly on the micro-organisms and invertebrates lost during and immediately after logging
- the effect of the removal of such a large biomass from the ecosystem
- the effect of biomass removal on the energy stored in the ecosystem in the coupe in the short term and in the management area in the long term
- the intrusion of pests in an unbalanced system and the subsequent environmental and economic cost incurred.

While it appears that some information is being accumulated on the larger more visible macropods, data on the smaller and less visible organisms is apparently almost non-existent. But these supposedly "less important" organisms are of equal importance in the web of life that supports the forest ecosystem. As indicated above, statements on the effect of logging on these species are non-existent in this EIS. The effect of such a radical change in microclimate as brought about by log-ging is not described even though it could mean loss of species from individual coupes in the short term and possibly from the whole area when alternate coupes are removed. The implications of this for predator/prey relationships is not addressed.

The effect of integrated logging on the air flow alterations brought about by removal of such a large part of the forest canopy is not addressed nor is the effect on mists and the water cycle as a whole (especially in mountain areas) of removing the larger trees, leaving first of all bare earth and, in time, shallow-rooted regrowth.

The effect on the range of organisms, evolved to survive and maintain a shaded and stable ecosystem, of exposure to the elements following logging is not addressed. Microflora and fauna of the soil and litter could be expected to be specifically vulnerable.

# Social Impact

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> The 1991 EIS does not contain any analysis of the social impact of logging and roading activities in Devils Creek. Given that such activities will have a major impact on the rural community based in the Tantawangalo and Candelo area, and on a much wider public because of the plan to log koala habitat, then a full social impact analysis of the proposal is required to fulfil the proponents obligations under the Environmental Planning and Assessment Act. Until the social impact of the proposal is completed this EIS does not meet the requirements of the legislation, and the determining authority, which in this case is also the proponent, must see that it is carried out and publish another draft EIS for public comment.

> The response to the 1991 EIS will now address particular issues under specific headings.

# KOALA COLONIES IN TANTAWANGALO STATE FOREST

The Forestry Commission's EIS tells us very little about the koala colonies in Tantawangalo State Forest, nor about the habitat needed for their survival. This is because so little is known about them.

"It has become clear that any attempt at this stage to define "prime" and "marginal" habitat for this species would be premature. Problems with assessing relevant habitat features and the significance of various forest or vegetation communities to koalas have arisen for several reasons. In the first instance, the animals are no longer in what was originally prime habitat, that having been cleared well in the past as indicated above. Furthermore, there is little conclusive information from the available records on koala sightings regarding the food-tree species utilized by the animals, or regarding the forest or vegetation communities they inhabit in this region. Consequently, little assessment from prior sightings is possible and the definition of the relevant habitats for koalas in this area will depend on further survey." (EIS, page 51)

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Not only is so little known about their habitat, there is no idea of koala numbers, nor of their distribution. The EIS suggests that the concentration of sightings around Mt Darragh could be because "it is possible that the partially cleared private lands are a significant feature for the maintenance of koala populations, or that the sightings could be of animals which have come from a population some distance away and are simply moving through the area in search of suitable habitat." In a further paragraph it suggests that the sightings, "may be a product of observer bias."

This is almost certainly the case. The sightings of koalas that have occurred in this area have been either along fire trails or on the border between the private property and State Forest because that is where people are. (It has been our experience that very few people have left the fire trails and walked through these forests.)

There have been koala sightings right around the periphery of Tantawangalo State Forest south of the Bombala Road, from the Mt Darragh area on the Bombala Road itself, on Carey's Fire Trail (this sighting was not mentioned in the EIS: may we ask why?); along Chalk Hills Fire Trail and on private property near Wyndham.

Surely this list of sightings should convince even the Forestry Commission that it is quite likely that these koalas range over this entire forest and that the reason they have only been seen on its periphery is because that is where there are people to see them.

It is precisely because so little is known about the distribution, numbers and habitat preferences of these koalas, that there must be a moratorium on all logging and roading until that information has been gathered and acted upon. The Forestry Commission can have no idea of the impact their activities will make because it does not have this information. And that should be the end of the argument. However, as the Commission has made it clear that it intends to continue its activities regardless, we present here the argument why we believe that logging and roading could jeopardize the survival of the koalas in this region.

The inadequacy and short-sightedness of the EIS is well demonstrated in its dealing with the koala issue in Devils Creek. The authors state (appendix 1, area 8(v), item 2.6.3) that known preferred food species for the koala are "rare to absent." The NSW Forestry Commission consultant Mr Dominic Fanning has stated that preferred food species for koala in this area is unknown, and that only long term research will provide this information.

Again, the EIS states (appendix 1, area 8(v), item 2.6.3) "Koala may be present in very low number in specific sites." The fact is that koalas <u>are</u> present. How many, or population size, is unknown. The comment "low numbers" could be interpreted as bias toward the Forestry Commission in legitimising the logging of the area. In fact according to Mr Fanning, present knowledge of koala colonies indicates that the colonies must be of reasonable size to survive in the long term. The fact that a colony <u>has</u> survived in the longer term in the Devils Creek area indicates therefore that it is likely to be of reasonable size.

### EIS Comments on the Logging of Koala Habitat

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What is quite extraordinary is what the EIS <u>doesn't</u> say about the likely impact of roading and logging on koala colonies within the area. There is no mention of the stress these animals will undoubtedly suffer as a result of blasting and the roar of heavy machinery. There is no comment about the inevitable increase in feral predators nor is there a word about the increased dangers faced by koalas forced onto the ground as a result of cleared habitat. And, finally, there is nothing about the acute stress that the loss of food sources will have on these animals.

The only comment the EIS has on the effect of logging koala habitat is the following:

"Koalas consistently display a preference for young foliage, particularly that "on more rapidly growing trees." This is thought to be due to the lower levels of the secondary plant compounds, which are used for defence against folivores, in younger rapidly growing foliage. A consequence of this observation is that a significant element of the management of koalas in the southeastern forests may be the harvesting or selective logging of areas of forest near to or within koala colony sites. This management strategy would encourage vigorous growth of younger trees to provide adequate volumes of high quality food and could be applied selectively to promote those species favoured by the animals." (EIS, page 52)

This is a highly questionable statement, made without reference to any scientific research on the subject. Indeed, L Pahl, F R Wylie and R Fisher, in their paper, "Koala population decline associated with loss of habitat and suggested remedial strategies," state quite the opposite: "Forests classified as tall and medium dominated by trees more than 10m high, with a canopy cover of more than 10%, appear to provide the main habitat of koalas."

The EIS statement is not only highly questionable, it is also not balanced with the extensive research which has established that the greatest threat faced by the koala is loss of habitat. It is either the case that the Forestry Commission is unaware of this research or is ignoring the scientific evidence which demonstrates how destructive their logging operations will be on surviving koala colonies in the area. In order to reach some sort of balance in the subject, we include some of the conclusions taken from scientific papers submitted to the Koala Summit, University of Sydney, November 1989.

"Our reading of the historical record is that the data demonstrate that all other viewpoints concerning the decline of the koala in the Bega Valley are subsequent

to and are the result of the fragmentation of habitat." (D Lunney & PC Reed, "Habitat Loss, The Key Problem for Long Term Survival of Koalas in NSW")

"The koala depends on a consistent supply of eucalyptus foliage of adequate quality. This makes the koala poorly adapted to sudden interruptions to its food supply ... It is my contention that the prevalence of chlamydia related diseases is a result of a more fundamental problem with koalas, and not the cause of the dilemma in which the koala finds itself. .. What is the basic problem? My contention, and that of other biologists, is that the primary threat to koalas is habitat fragmentation. . One of the most effective ways of fragmenting koala habitat is to put a network of roads through it." (Ian D Hume, "Biological Basic for the vulnerability of koalas to habitat fragmentation")

"The Third Symposium in Melbourne in February 1988 on the Biology of the Koala identified habitat destruction as the major threat to the survival of the koala. Clearing of forests. . . is causing further reduction and isolation of koala population and may eventually result in their disappearance from some areas unless changes are made to land management practices." (L Pahl, *et al*)

Both Devils Creek Rd and Shay Rd will facilitate the access of feral animals into both the southern and northern portions of the catchment. Both foxes and wild dogs are known predators of koalas and surely every effort must be made to prevent their entry into the area.

We note that the Forestry Commission intends to construct the Devils Creek Rd within a few hundred metres of the area where members of the TCPA located a female with young in November 1990. Surely the Commission cannot really be intending to construct a road right into an area where koalas are undoubtedly living.

It is impossible not to conclude that the Forestry Commission's proposed activities are a major threat to existing koala habitat in the area and will jeopardise the chances of this animals survival in this region.

### **Devils Creek Koala Habitat Study**

When the Tantawangalo Catchment Protection Association received a government grant to study koala habitat in the Devils Creek catchment, its members concluded that the study should focus initially on the northwestern position of the catchment. This was for the following reasons:

### 1. Fertility

This is where some of the most fertile areas in the catchment exist. There is a large occurrence of basalt capping east of the Knox Valley Fire Trail. Furthermore, the moist, south facing slopes nearer to Devils Creek provide an environment for the build up of humus and consequent soil fertility. In their paper presented to the Koala Summit, S J Cork, C R Margules and L W Braithwaite, "Implications of koala nutrition and the ecology of other arboreal marsupials in south eastern

<u>NSW for the conservation management of koalas</u>" stated: "From the sparse data available it appears that koalas, like other leaf eating marsupials, prefer forests which grow on soils high in available elemental nutrients."

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# 2. Undulating Topography

Braithwaite *et al*, in the same paper stated the following: "Also, forests growing where landform is undulating tend to have a greater variety of tree species present, in a complex mosaic pattern than do forests on steeper topography. Consequently there is a greater proportion of the year in which at least some trees are growing and reproducing and high quality food resources like young leaves and flowers are available." The area selected has some of the most pronounced undulating topography in the catchment.

# 3. <u>Refuge</u>

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Because the northern side of the catchment has a southerly aspect, it is here that most of the areas of high moisture retention are found. It is therefore likely that drought and fire refuges which provide suitable habitat for koalas will be found here. Furthermore, this area probably provides more sheltered habitat from the prevailing northwesterly winds than any other in the catchment.

### 4. Similar Habitat

This area has locations within it which have a similar eucalypt species mix, altitude and aspect as the site where members of the TCPA discovered a breeding female koala with two young in November 1990.

Having decided on this northwestern segment and having made several initial survey trips into the area, we now discover that the Forestry Commission intends a major roading and logging program in precisely those areas that we believe are most likely koala habitat.

# The Forestry Commission/NPWS Regional Koala Survey

In January 1990 the Minister for Natural Resources, Mr Causley, released a press statement promising a thorough koala research program in conjunction with the NPWS in order to prepare a koala management plan for the south east forests. In April 1990, the Forestry Commission stated in its final EIS that "the lack of agreement does call for further investigation in the Devils Creek catchment," and that these surveys "are now being undertaken in conjunction with the NPWS."

The April 1990 EIS contains no less than three references to this research being in progress.

Since then, apart from Dominic Fanning's consultancy report, which emphasises how little is known about koalas in the region, nothing has happened. At the time of writing the steering committee, which has the responsibility of designing and overseeing the survey, has not even met.

The public deserves a very clear explanation from the Forestry Commission as to why it is taking so long to get the regional koala survey underway while at the same time it has developed a major roading and logging program in the main area to be covered by the survey. We can only emphasize once again that it is totally unacceptable to us that any further roading and logging occur in this area until the regional survey is completed and a satisfactory management plan implemented.

### The Inadequacy of the Pre-Logging Surveys

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The Forestry Commission is suggesting that its pre-logging surveys would be an adequate replacement for the regional survey. The EIS (appendix 1, area 8(v), item 2.6.5) states, "Each logging area will be surveyed for koala presence prior to logging." And then adds in item 2.6.6, "If koala presence is established, harvesting will be curtailed as necessary."

We find the suggestion that pre-logging surveys would be sufficient to be quite extraordinary. Even the former Regional Forester, Mr Tony Howe, acknowledged their inadequacy when interviewed on the radio program Earthworm in December 1990. The presenter, Peter Hunt, asked, "I suppose that it is implicitly admitting that the sorts of survey techniques that go on a coupe by coupe basis may not be adequate to ensure their long term survival in the south east; that you have to take much more of an overview of such a rare species." Howe replied, "Yes, look, I believe that you have to consider things on a regional basis. I think that it is reasonable to look at individual coupes wherever you are going to log a very small area, but once you start looking at a broader area of forest, you have to take a regional, or sub-regional view."

Even the Forestry Commission must now be aware how difficult it is to establish whether or not there is a koala presence in a particular area. There is no way that the sort of pre-logging surveys undertaken by the Commission can ensure there are no koalas in a particular area, particularly when we do not know what is their preferred habitat. And indeed, even if koalas are not present at the time of the survey, we cannot be sure that the area will not be used during another time in their feeding cycle, particularly during times of drought when food sources may be critical.

Should the Forestry Commission have any doubts about this matter, we suggest they look closely at the area that Fanning recommends should be the focus of the regional study. There, in its epicentre, is coupe 2453, an area which was "intensively" surveyed by the Forestry Commission before it was logged, even though it is almost certainly koala habitat. It remains as a monument to the Commission's appalling record of koala mismanagement in the south east forests.

# The Significance of Koala Colonies in the Tantawangalo State Forest

The EIS has nothing to say about the likely significance of the koala colonies in the Tantawangalo State Forest. This is no doubt because the existence of koala colonies in this area has profound implications for forestry operations. In the TCPA 1990 EIS submission we quoted Dr T Norton, Research Fellow from the Centre for Resource and Environmental Studies: "The species is rare between Newcastle, NSW and Westernport Bay in Victoria, and very rare in the South East Forests where only three remaining areas have been identified as important for koalas. . . Based on the length of sightings and the mosaic of eucalypt species, this catchment area may be the most important of these three areas for koalas [while] the catchment and its associated intact forest could play a key role in the conservation management of the species in the entire region."

Almost all surviving koala colonies in southern NSW and northern Victoria are hanging on in isolated and fragmented habitat. One reason this area is so significant is that the forest is relatively intact and undisturbed. The koala colonies in Devils Creek and other areas in the Tantawangalo State Forest have genetically adapted to, and demonstrated their ability to survive in, these forests.

If we can ensure that their habitat remains undisturbed and if sound management policies can be introduced to protect them, then the future of a very significant link between the major koala populations to the north and south may well be assured.

If any further koala habitat is fragmented and destroyed in the way that this EIS is proposing, the Forestry Commission will be committing an appalling act of folly. The public will conclude that the Commission has not learnt from its past errors and is continuing to blunder on into our forests with the same level of arrogance and incompetence which has so often characterized its management policies in the past. Public concern on the issue will only be allayed when the Forestry Commission gives a very clear undertaking to desist from any roading and logging activities in this area until the regional survey is completed and a satisfactory management plan implemented.

### **ABORIGINAL SITES**

The Forestry Commission's consideration of significant aboriginal sites in the 1991 EIS should be assessed against the professional advice it has received. S Feary, "Preliminary investigations for archeological sites in the Eden woodchip agreement area" 1988 and D Byrne, "Archeological Survey of Proposed Forest Roads in Eden and Bombala Districts, NSW," Report to the Forestry Commission, NSW, 1990, make the following comments:

1. "Recent field survey by NPWS staff has demonstrated that archaeological sites are common in the escarpment forests." (Feary, page 8)

2. "The sites that have been recorded so far are only a small proportion of those that exist. Until such time as they can be assessed in a wider regional context through extensive surveys they are of the highest significance. There is no doubt that sites will be destroyed by logging operations because they have gone unrecognised. . . It appears that except for the steepest terrain, sites can occur almost

anywhere." Feary goes on to recommend "prelogging surveys within blocks proposed to be logged." (Feary, page 10)

3. "It can be argued that the most appropriate areas for reservation in regard to Aboriginal sites would be swamps and river corridors which are often exempted from logging anyway. It should be noted, however, that these areas would be severely affected indirectly through erosion, log dumps and access roads." (Feary, page 11)

4. "It is axiomatic that forests are variable in their structure and composition, according to rainfall, aspect, slope, soils, geology, etc. Given that hunter-gatherer societies were finely tuned to very small environmental changes, the practice of applying site prediction models based on one forest type to all forests is intellectually simplistic and of dubious value to forest resource management. It overemphasises similarities and ignores socioeconomic differences amongst aboriginal groups. (Feary, page 88)

5. "There is a local tradition about an Aboriginal massacre/ceremonial ground within the Tantawangalo State Forest but this has yet to be confirmed." (Feary, page 6)

6. "Sites. . . will tend to be situated in flat areas such as saddles, along ridgetops and on the flat margins of larger watercourses, representing campsites and other activity areas of small and highly mobile groups of people moving through the forests from bases in the larger river valleys and along the coast." (Byrne)

### Concerns with the 1991 EIS

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Despite Feary's comment that archaeological sites are common in escarpment forests in general (points 1 & 2 above) and Tantawangalo in particular (point 5), the EIS reports (appendix 1, area 8(vi), item 2.8.1), "None identified or expected. No significant sites in adjacent areas." And (item 2.8.2) "Investigations: None required."

Byrne confirms that likely sites (point 6 above) are precisely where roads are surveyed ("to minimize earthmoving") ie, on ridges and flat areas.

Considering the proposed construction of Shay Rd the EIS states, "No known sites." and, "Likely sites will be investigated during road survey." (appendix 1, area 8R1(iii), item 3.6)

The concern here is that there are no provisions stated in the EIS to ensure that the expertise required to identify sites will be present during the road survey. Presumably both the identification of likely sites and the confirmation of their significance is the prerogative of aboriginal knowledge or archaeological assessment.

Feary raises the concern that a substantial effort to locate significant sites prior to road survey is required. Although the Forestry Commission makes some unspecific provision for this, Feary's recommendation of prelogging surveys within blocks proposed to be logged stresses that a broad and thorough research effort through systematic appraisal of high probability zones is required.

While the Forestry Commission asserts that a system to enable identification of sites is being pursued with NPWS (EIS page 67), Ms Feary has since confirmed that no real effort has yet been made in this.

It should also be noted that Ms Feary's warning on the limitations of predictive models (point 4 above) should be considered and that nothing short of extensive research with combined Aboriginal knowledge and archaeological expertise would ensure the preservation of at least some of the sites within the Devils Creek area and other parts of the Tantawangalo State Forest.

### HYDROLOGY AND SOIL EROSION

The Forestry Commission of New South Wales EIS of February 1991 is deficient in its consideration of the significance of the impact of forestry harvesting and roading on the catchment hydrology and soil erosion. It is well known that the granite soils of the region are highly erodible and that soil erosion constitutes a major environmental hazard. In a report to the Bega Valley Shire Council, 13 April 1981, the District Soil Conservationist at Bombala, Mr C Marshall, described the Devonian granetoid soils of the region as having "a high to very high erosion hazard if disturbed or bared of vegetation."

The EIS does not adequately address erosion and virtually dismisses it as a hazard. The Forestry Commission has not produced any evidence of a single definitive study of soil erosion having been completed in the woodchip concession area. This omission is one of the major scientific failings of the EIS.

The 1991 EIS contains proposals for major logging and roadworks in the Devils Creek catchment but dismisses any impact this may have on water quality and quantity. Item 2.4.2 of the EIS appendix states the following: "Logging will cover less than 4% per annum of the 2,600 hectare sub-catchment." The figure of 4% cannot be correct. Although the exact figure is not given, the total number of hectares within the 7 coupes the Forestry Commission proposes to log in the catchment must be well in excess of 250 hectares. This comprises at least 10% of the forested portion of this catchment which is approximately 2,000 hectares.

Furthermore, all 7 coupes have a predominantly southerly aspect. In times of drought it is highly likely that much of the water which flows into Devils Creek comes from these areas. The logging of such a large and important part of the catchment will undoubtedly have a profound and serious affect on its hydrology.

There is also no evidence of any understanding of the significance of Devils Creek as a water supply for the rural community. It is outright misrepresentation of the facts to state, as this EIS does that the Creek is only important for a few rural
users. The correct situation, as was stated quite clearly in the TCPA 1990 EIS submission, is that during times of drought the main flow of the Tantawangalo Creek is diverted to the Coastal towns via the water supply weir and the great number of rural users are totally dependent on Devils Creek, which enters the Tantawangalo Creek below the weir. Any EIS that proposes to alter the catchment in any way should as a minimum have a proper hydrological analysis of the importance of Devils Creek to the regional economy.

## Adequacy of filter strips

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The reason given in the EIS for the <u>assumption</u> that bedload does not enter streams is that it is prevented from doing so by filter strips of natural vegetation that is left intact along watercourses. However, Dr Dianna Day, a hydrogeomorphologist and presently Senior Research Fellow, Centre for Environmental Management, University of Newcastle, stated in a consultancy report of November 1987 commissioned by the Tantawangalo Catchment Protection Association, that:

"Bedload transport and distribution is a high function of discharge, and particularly extreme precipitation and runoff events. If any land cover is disturbed a likely rise in runoff volumes will move more bedload for the extreme runoff events."

Dr Day also stated that the claim by the Forestry Commission that filter strips and logging debris comprise an effective barrier to increases in suspended and bedload quantities has no substance and concluded that:

"The statement is at variance with geomorphic and engineering principles."

#### Unconsolidated sediments

The problem of unconsolidated sediment accumulating in the coupes following logging that could be released into the streams during extreme events such as heavy precipitation following wildfire has not been addressed in the EIS despite the scientific evidence presented by J S Burgess, "Sediment yield change following clear fell logging and wildfire in dry sclerophyll forest in southeast New South Wales," Occasional Paper No. 45, Department of Geography, University of New South Wales at Royal Military College, Duntroon, 1984.

Another major cause of sedimentation is the extensive network of roads that comprise the essential infrastructure for integrated logging. The EIS fails to present any scientific justification given for this major environmental impact of roads. Roading is only briefly discussed and in the most general terms. This must be regarded as a major deficiency given that long term studies of the problem have been carried out by the Melbourne Metropolitan Board of Works and that those reports are available to the public. This Board, in its "<u>Water Supply Catchment</u> <u>Hydrology Research Summary of Technical Conclusions</u>" 1979, Melbourne Metropolitan Board of Works, Report No. MMBW-W-0012, 1980, page 22, stated:

"Preliminary data from the study show that unsealed road surfaces generate some 40 000 kg/ha/annum of sediment compared to less than 500 kg/ha/annum from

undisturbed forest catchments, that is an increase in the sediment production of 80 times."

## Catchment hydrology

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The results of the Yambulla studies are used to discount many of the adverse impacts on water quantity and quality. However, there is grave doubt on the validity of the Yambulla studies because in Appendix 6a, within Appendix 1a of the Forestry Commission 1988 EIS, it is stated that the short period of the study combined with the fact that it took place during a drought leads to it being inconclusive.

Notwithstanding these acknowledged shortcomings, the Forestry Commission continues to quote the Yambulla study as showing that turbidity (used as a measure of erosion alone instead of in conjunction with bedload as should be the case) increases following logging and roading with an apparent return to normal within five years. Quite apart from the possibility of this being an erroneous assumption, it also overlooks the cumulative impact over 40 years as each logged sub-catchment makes its contribution of erosion material. This continuing addition of material is then started again as the logging enters its second 40 year cycle. This serious cumulative environmental impact is not addressed in the EIS.

Of great concern is that no EIS prepared by the Forestry Commission has responded to, or even acknowledged the existence of, critical scientific evidence presented by two eminent Australian hydrogeomorphologists who have worked in the south east forests showing that the experimental design of the research quoted by the Forestry Commission to justify its proposal is fundamentally flawed. L J Olive and W A Rieger, in "Problems in assessing the impact of different forestry practices on coastal catchments in New South Wales", in R F Warner, (ed) Fluvial geomorphology in Australia, Academic Press, 1989, casts serious doubts on the validity of the paired catchment methodology used in the Yambulla studies to determine the impact of logging on water quality and quantity.

## Soil structure

A further deficiency in the EIS is the lack of scientific evidence about the impact of logging operations on soil structure and its consequences on catchment hydrology. In appendix 6a, located within Appendix 1a of the Forestry Commission 1988 EIS it is stated that:

"Preliminary results show that logging destroys soil macropore structure and causes the soil surface to become sealed, thereby reducing infiltration and significantly increasing overland flow." (Moore *et al*, technical notes in preparation)

However, this serious environmental impact has been ignored in both the 1990 and the 1991 Forestry Commission EIS's.

# DEFICIENCIES IN THE 1991 EIS IN THE TREATMENT OF ECONOMIC IMPACTS AND EVALUATION OF ALTERNATIVES

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> The benefits of the timber industry for the south east region are greatly overstated in the 1991 EIS. Nor does it clarify the proportional contribution of the timber industry to the regional economy.

> The statement (EIS page 4) that the timber industry is the major industrial activity in the region is incorrect. Other industries that are more important than the timber industry's 6% of direct employment are:

agriculture & fishing (excluding forestry)	6%
manufacturing (less wood processing)	7%
construction	8%
wholesale & retail	17%
finance, property & business service	7%
community services	13%
recreation, personal and other services	10%
(see also comment on tourism below)	
(source: Clarke, 1989)	

The multiplier used in the EIS to estimate jobs indirectly created by the timber industry is incorrect, and overstates the number fo jobs created in the region. The multiplier for the state of Victoria is used. Clearly a regional multiplier should be used, as in a region such as south east NSW many of the goods and services required would come from outside the region. If the multiplier for a region such as East Gippsland is applied the result is 437 additional jobs created in the region, not 650 as stated in the EIS.

By contrast, the tourism industry in the Bega Valley Shire has been estimated to generate about 2000 jobs or 23% on the Shire's employment (NSW Tourism Commission, 1989).

The EIS also appears to assume that existing levels of employment and production in the regional timber industry will continue indefinitely. No attempt is made to recognise and forecast declining levels of employment due to competition from softwoods and from the massive hardwood plantations overseas which will be coming into production over the next 10 to 15 years.

No mention is made in the EIS of the costs of the huge subsidies to the industry noted in the report of the NSW Joint Parliamentary Accounts Committee. Nor is the extremely low return on total assets used in Forestry Commission operations considered, if these assets are valued realistically.

All these aspects should be examined in the EIS if it is to be a balanced account of socioeconomic impacts, rather than, as it is, a one-sided piece of advocacy.

## Alternatives

The 1991 EIS examines some alternatives to current forest operations. The reports it purports to summarise (eg, the Landsberg, Jones & Pryor report on the feasibility of native hardwood plantations in south east Australia, 1990) have not been released to the general public. There is therefore scope for the Forestry Commission to misrepresent the conclusions of these reports. In the case of the Landsberg *et al* report on plantation economic viability would require higher than expected growth rates or higher than current prices for pulp wood." This is a misrepresentation of the findings of the Landsberg *et al* report, which states (executive summary) "there are sufficient areas of land . . . where the development of plantations that will produce pulpwood is technically feasible and likely to be economically viable."

This level of misrepresentation is unacceptable in an EIS or any other document which purports to be professional and unbiased.

While some alternatives to current operations are discussed, others are completely ignored. For example, the extensive softwood plantations in the Bombala area will be fully on stream by the year 2000. This resource will be sufficient to support a softwood sawmill creating direct employment of 100 to 130 including logging and cartage (Clark, 1989).

A further alternative source of employment will be the softwood particle board plant planned for the region. This will employ 140 people.

It is not sufficient for the 1991 EIS to selectively update information on alternatives. All information should be noted. It should also be recognised in the EIS that alternatives such as native hardwood plantations, developments in the softwood industry and other alternatives can, taken together, provide substitutes for much of the employment in logging native forests, which will inevitably continue to decline.

# Location of Coupes

A further major deficiency in the discussion of alternatives in the 1991 EIS concerns the location of logging coupes. There are heavy concentrations of coupes in areas adjacent to both the Tantawangalo and the Coolangubra National Parks. In the absence of any justification for this in the EIS, it does not seem unreasonable to suspect that these areas of high conservation value are being intensively logged to destroy these values in order to prevent their being added to the national park system in future.

The EIS merely states that "all feasible and practical alternatives to coupes selected have been considered in this process." However, the purpose of an EIS is not to tell the public that alternatives have been considered, but to set out in detail the alternative patterns of coupes which could have been selected and the reasons for rejecting these in favour of the coupes selected. Because the areas selected adjacent to Coolangubra and Devils Creek are of high conservation value, it is essential that a full explanation of the concentration of coupes in these areas in 1991 should be given. SUBMISSION TO NSWFC EIS for the Edon Management Area, 1991

By: Stephen Jagoe 112 Upper St Bega.

GENERAL COMMENTS.

The objectives of the proposed activity in the Eden Management Area are to maintain a supply of sawlogs and pulpwood from prudent and feasible logging areas, and to ensure the regeneration of harvested areas. The proposed activity is meant to protect non wood values such as flora and fauna, catchment and cultural values, and to provide for the economic well being of the region.

As with previous Environmental Impact Statements, very little content of the document is devoted to the long term effects of the operation on the non wood values of the forests of the Eden Management Area. There is a mounting body of scientific evidence, including sections of the Joint Scientific Committee Report, to indicate that local ecosystems are under threat due to the effects of the operation.

The New South Wales Forestry Commission (NSWFC) has the advantage of being able to produce its own EIS, consider any submissions to it, and to formulate its final determination. Hence, as occurred with the 1990 EIS, little change will be made to the ensuing operation. Because the operation is quota driven; little credence is given to the large body of public concern as to the effects of the operation, and hence the NSWFC doesn't need to be accountable to anything but itself.

#### DESCRIPTION OF THE ACTIVITY.

The net area to be proposed for logging is about three times the area expected to be logged (including areas unlogged but considered by previous EIS's). Consequently, high conservation value forests do not need to be specifically targetted, as in this EIS. The following table gives a breakdown of expected forest yields excluding high conservation areas. The numbers are based on average yields as stated in the 1986 HDA EIS.

HARVESTING AREA	<u>a co</u>	UPE AREA (ha)		PULPWO	<u>)OD (t)</u>		SAWL	<u>.0G (m</u> .	<u>s)</u>
1.		302		30	200		6	463	
2.	·	185		18	500		3	959	
3.		941	-	. 94	100	•	20	137	
5.		141	т <b>р</b> , . 19	14	100		3	017	
8.	EXCLUDED					-			
13.	EXCLUDED		•						
14.	EXCLUDED								
16.	EXCLUDED								
17.	EXCLUDED						·		
17a.	EXCLUDED								

18.		1066		106	6001 .	10	553
19.		854		85	4008.	8	455
20.	EXCLUDED	•					
21.	EXCLUDED						
22.	EXCLUDED						
23.	EXCLUDED						
25.	EXCLUDED						
26.		840		42	000 (502)		
			TOTAL	390	300	52	584

Obviously this does not meet the agreed volumes to be supplied by the NSWFC. However there exists a large number of compartments outside high conservation forests that have been subjected to the EIS process, but are still unlogged or are partially logged. These could be used to make up the shortfall. In the NSWFC 1990 EIS estimated timber volumes outside National Estate areas totalled nearly 1.2 million tonnes woodchips and 170 278 m3 sawlogs. Clearly some flexibility exists here.

Another option available to the NSWFC is to <u>lower the scale of the operation</u>, as in the present economic climate demand for sawlogs is poor.

A third option is to commence second cycle logging (as in the Australian Museum report recommendations) in an effort to spare the remaining high conservation forests from logging and roading. This will allow further flexibility in the overall operation, as Harris Daishowa may be more likely to source its pulpwood from low cost eucalypt plantations in South America within the next decade.

#### MEASURES TAKEN TO PROTECT THE ENVIRONMENT.

The NSWFC assumes that the current forest management practices have little or no effect on the environment. Scientific evidence is continually buiding up to state the opposite (see Australian Museum report, New England University (Recher and Jenkins report), the Five forests study of Lunney and others). The NSWFC has had to change its management several times since the inception of the Eden Woodchip Project- ie changing from large coupe clearfelling to small coupe almost clearfelling back to medium coupe size "integrated" logging that still only leaves 10-15% tree cover.

Alternate coupe logging has only been in existence for 10-15 years, and its long term effects are still unknown. Recher et al express concerns of this technique in Forestry Commission Research note no.42 and later publications (Nature Conservation, the Role of Remnants of Native Vegetation). The EIS implies that the mosaic of forests types added to by regenerating forests is necessarily beneficial to forest ecosystems. This would be denied by most ecologists. As stated in Section 4.5.2. table 40.68% of State Forest land is subjected to integrated logging, and a further 15% to modified logging. After 40 years of the current operation 83% of state forests will be modified to a forests on the whole no older than 40 years. Rather than adding to diversity of habitat, this operation is narrowing the habitat diversity that formerly existed in state forests.

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REGENERATION AREAS (Section 4.5.3.3.): the 1991 EIS states that tree species composition following logging is very close to the original composition, with the main changes being relative abundance. The EIS quotes section 8.1.4 of the 1986 HDA EIS for further information. Several statements in this document are considered relevant-

"There will be permanent shift in the age class structure of the .....In addition there is the possibility of changes in species forest composition ..... Results are conflicting and may depend on whether or not there is a post log burn.... In the opinion of the author, the question of changes in species composition following logging and fire requires further attention, so that long term trends can be identified and, where necessary, reversed through appropriate silvicultural treatment. Any increase in species such as E.sieberi is undesirable not only because of the reduction in floristic diversity but also because of the likelihood of a corresponding reduction in faunal diversity .... In the Eden Management area, studies of the effects of logging and fire on understorey vegetation have lagged well behind faunal studies. In the opinion of the author, these are important areas of research that need to be addressed. Noticeably lacking are comprehensive studies of the population ecology of individual understorey species..."

FIRE PROTECTION. (Section 4.5.3.4): The EIS states that "wildfire has been an important part of the natural environment since the advent of white man". One assumes from this statement that wildfire is a a necessary part of the local ecology and hence may be necessary to maintain viable local ecosysytems. However the EIS neglects to consider the effects of "control burning" of 76 646 ha of state forest on local ecosystems. As indicated in the Australian Museum Report on the South East Forests the effects of a burning operation of this size is unknown. The role of "control burning" in reducing the incidence or severity of wildfire is also questionable. The EIS also neglects to consider the detrimental effects on the environment of roading ie habitat fragmentation, predator and noxious weed ingress, and sedimentation of waterways. Public statements by the former Regional Forester, Tony Howe indicate that fire is more likely to proceed rapidly through logged areas and then slow down once old growth areas are encountered (T.Howe in communication with Resource Assessment Commission staff, Oct 1990).

BIOLOGICAL SURVEYS. (Section 4.5.4.2): The EIS implies that biological surveys are an integral part of protecting the environment. However previous studies indicating the existence of rare and endangered species have been ignored by the NSWFC. Despite the discovery of remains of Potorous longipes in a fox scat in 1986 in Bondi State Forest logging and roading proceeded. As recently as September 1990 post log burning of Compartment 1721, abutting long footed potoroo habitat, has occurred, possibly compromising the likely range of the species. There appears to have been little consideration given to the likelihood of the species occurring in the "Southern Creek" area of the South Rocton section, despite® the prediction of BIOCLIM, and investigative work of Dominic Fanning. Indeed one logging coupe in Compartment 1763 appears to be scheduled on top of this likely habitat. It also appears that this situation is unknown to Fanning (pers.comm.).

Despite the fact that members of the Tantawangalo Catchment Protection Association discovered a koala mother and her young in November 1990, and despite the fact that field work for the Koala'Steering Committee is yet to commence, six logging compartments and an upgraded "biological survey road"

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(Shay Road) is contemplated for 1991-2 in the Devil's Creek area of the Tantawangalo State Forest. This overrides the need for detailed survey work to investigate the biology and ecology of the koala in so called suboptimal habitat. One must also question the competence of the NSWFC consultant involved with the research project, who has recently publically stated his research expertise lies in platypus, and has "an interest" but apparently little research experience with koalas. This same consultant was also unable to conclusive evidence of the long footed potoroo in the Sheep Station Creek of Bondi State Forest, whereas experienced researchers did (Saxon and Pascoe).

The EIS implies that prelogging surveys undertaken by its staff are adequate to locate all ranges of endangered species. No indication is given in the EIS as to the formal training of staff to undertake these studies. Indeed if the experience of a member of the South East Conservation Working Group is a typical example then this method of forest appraisal must be seriously questioned. In Compartments located in the Tanja State Forest members of the community have indicated the presence of the Powerful Owl <u>Ninox strenua</u> in the area. The 1982 Eden Management Plan also indicates the likelihood of the koala <u>Phascolatus cinereus</u> occurring in this forest. Discussions with Forester Paul Roberts indicated the number of prelogging night surveys to <u>total one</u>, and if during logging a powerful owl's nest was located the tree containing the nest would not be removed. This statement appears to disregard the overall ecological requirements of this endangered species. One would hopefully assume that a tree bearing a koala would also be left.

#### JOINT SCIENTIFIC COMMITTEE ON SOUTH EAST FORESTS. (4.5.4.3.)

The NSWFC has used the JSC Final Report to justify current forest management techniques. The specific objective of the Committee process was to assess the biological values of National Estate areas of the South East. The EIS has provided misleading statements to imply that the JSC has examined in detail the whole of the Eden Management Area. For example, p.28 of the EIS states that the JSC undertook to "characterise the flora and fauna of the region". Page 3 of the JSC report states TOR 1 to be "To characterise the flora and fauna in the [National Estate] areas to be surveyed, taking account of information from completed studies".

To make the EIS statements on p 28 accurate, one must add the words <u>National</u> <u>Estate</u> after each statement about the studies of the JSC. The statement that "no scientific evidence to indicate that current management practices will result in the extinction of any organism, either plant or animal" hasn't stood up to scientific scrutiny. The studies of Lunney et al, work by Recher et al, and the Australian Museum report all challenge this broad statement. Yet it is likely that in the world of forestry this single statement will become folklore.

The EIS's second quote from the JSC Report is also misleading: again the words <u>National Estate</u> have been removed to imply the JSC considered all of the EMA. The quote should read "Given an enlarged reserve system multiple use forestry incorporating wood production can take place within National Estate forests outside reserves..."

The EIS in its quotation of P.59 of the JSC report attempts to imply that because local ecosystems are not necessarily unique, there is a reduced need for conservation. The statement ignores the threats to similar ecosystems in other areas, especially the Gippsland forests.

Basically, by quotation of selected extracts of the JSC report, the NSWFC is attempting to add a depth of research to its EIS that does not exist. Several leading scientists have criticised publically the quality of the JSC report.

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These include:

Dr. Tony Norton, Forest Ecologist, CRES, Australian National University.

Dr. Hugh Possingham, Theoretical Ecologist, Research School of Biological Sciences, Australian National University.

Dr. Jamie Kirkpatrick, Head, Department of Geography and Centre for Environmental Studies, University of Tasmania.

Dr. Hal Cogger,Assistant Director for Research, Australian Museum.

Liz Dovey, Researcher, NSW NPWS.

Dr. Allen Jones, Researcher, Australian Museum.

Dr. Harry Recher, Associate Professor, Department of Ecosystem Management, New England University.

Dr. Penny Greenslade, Convenor of the Conservation Committee of the Entomological Society of Australia.

Dr. Chris Margules, CSIRO Division of Wildlife and Ecology.

I am not aware of any scientists speaking out 'publically supporting the JSC report.

With respect to the environmental domain system of the JSC, Kirkpatrick has stated "...the extent to which these <u>abstract</u> environmental domains reflect the range of biological variation in <u>reality</u> (on the ground) remains to be investigated." The EIS states that correlations of species and domain have been cross checked, but has not indicated what the outcome of these investigations has been. Again these studies have only included National Estate areas.

At the same time the scientist who developed the software used in the JSC analysis, Lee Balbin, has stated publically that the program used to derive the final outcome of the JSC domain system was flawed, and gave inappropriate weighting to climatic variables. Even though this flaw was discovered 4 days before the releases of the final report, no changes were made. (Canberra Times, Dec, 1990).

Kirkpatrick concludes the major deficiencies of the JSC report as being:

" (i) its philosophical stance; [ie one of the view of a forester] and,

(ii) a set of conclusions and recommendations that <u>do not</u> flow from the data presented.

The authors of the report seem to take the attitude that logging should continue until it is conclusively proven guilty by science of crimes against biological conservation."

Norton and Possingham state in their analysis: "There are serious flaws in the Joint Scientific Committee's report, particularly regarding the methodology, use of ecology theory, and understanding of critical issues in conservation biology. Many of the opinions expressed in the report.... are not objective."

Finally the EIS states that as a consequence of the findings of the JSC, an area of 47 000ha has been reserved from logging. However in the light of the quality of the findings of the Committee and the subsequent scientific

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OPERATIONS LIKELY TO BE SCHEDULED IN 1991 AND INTO 1992.

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criticism of the report, it is concievable that very little in the way of biological conservation in the South East has been achieved with the new reserve boundaries. The final decision was a political one.

#### AUSTRALIAN MUSEUM REPORT 4.5.4.4

The EIS's analysis of the Australian Museum report is basically from the viewpoint of wood production interests versus the scientific evidence provided by the authors of the report.

The EIS asserts that the alternate coupe system is a "key component of the management system which has been put in place to achieve sustainable development and to ameliorate environmental impacts in the region. It is difficult to understand why a report concerned with wildlife conservation, should promote a harvesting system which is contrary to good conservation practice and integrated resource planning aimed at achieving sustainable development". This EIS, and those before it, have not considered the large amount of scientific information that concludes the current management practices will increase the probability that forest dependant flora and fauna will become extinct. The EIS provides no evidence to prove that management practices do in fact provide a basis for sustainable forestry, and at at the same time preserving and enhancing all the non wood values within the forest.

Comments on the EIS's analysis of the Australian Museum report correlate with the numbering system on pages 30-33.

1. The EIS asserts that the changes brought about by logging are well within the order of changes due to natural events. Most forest ecologists would argue this statement, especially as the EMA operation affects 5000-6000 ha per year.

2. The EIS assumes adequate areas of "moderate" topography are reserved. Analysis of the table presented on p.30 indicate that substantial areas of two land systems only are reserved, is coastal zone and western sandstone plateau. Of the remaining 8 land zones, only 1-38 % of these zones within Crown Lands are reserved. The addition of 47 000 ha to the reserve system will do little to improve this situation.

4. The koala research programme appears to have been diluted since last year's EIS, which implied that regional research would be undertaken before further logging would occur in areas of higher probability. This year, logging will occur in likely areas when koalas are not located in proposed coupes. This ignores the nature of the koala, which grazes a large area of forest and doesn't necessarily restrict itself to a coupe to be logged. The studies of Lunney et al indicated the danger to the survival of Microchiropteran bats posed by the current logging operation. Again the NSWFC assumes that their management practices are totally adequate.

7. The proposed Coolangubra National Park has had its boundaries determined by wood supply needs rather than conservation needs. The majority of this area will be what used to be P.M.P 1.2 equating to "undeveloped natural forest. Logging is excluded normally from these areas because of steepness, low yields of timber or inaccessability.

9. The EIS doesn't consider the environmental implications of its burning regime.

14. A critique of the documentation of previous land use studies can be found in a review by Lunney and Moon (1988) "An Ecological View of the History of Logging and Fire in Mumbulla State Forest on the South Coast of New South Wales."

#### 5.2.1 VEGETATION SURVEYS:

A request was made to Mr.A.Sebere at the Eden office of the NSWFC for copies of the surveys performed by Fanning and others. A verbal assurance was given that most of the requested documents would be supplied. However I was subsequently advised that advice was to be sought as to their availablity. Comment cannot be made on this work without visualising these documents. 7.

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The methodology of the work performed by Fanning and Mills and Fanning and Rice in the Bondi State Forest has been questioned by NSW NPWS personell.

#### 5.2.2. FAUNA SURVEYS.

(i) Mammals.

The 1991 EIS states that the JSC has indicated that more research should be carried out on the following species:

Squirrel Glider <u>Petaurus norfolcensis</u>, and states that this rare species has as its preferred habitat drier more open forests and woodlands. This type of habitat forms a large part of the EMA;

Platypus <u>Ornithorhynchus anatinus</u> and the water rat <u>Hydromys</u> <u>chrysogaster</u>. Both species would be affected by the changes in water quality that occur after logging.

Other species are listed as being rare (brushtailed phascogale, spotted tail quoll, brushtailed rock wallaby, smokey mouse and the common walleroo). There is no indication in this or previous EIS's as to the likelihood of research being carried out on these animals.

Volant bats: these are not well sampled. The NSWFC appears to believe its management practices are sufficient to maintain viable populations of these mammals. The studies of Lunney et al indicate that bats are under threat by current management practices.

(ii) Birds.

The EIS states that the JSC has recommended further work on the Regent Honeyeater and the Eastern Bristle Bird. No indication is given in Section 6 of the EIS as to whether this will occur.

The EIS for some particular reason singles out the Ground Parrot <u>Peroporus</u> <u>wallicus</u> which appears to require fire management to maintain its habitat. The NSWFC is attempting to justify its fire management regime in this particular instance, even though the EIS and the JSC report do not state what kind of fire management is required. Perhaps natural fire events, such as those which occurred before the advent of commercial forestry, adequately maintained this species.

(iii) Reptiles.

Again, the JSC notes that further research is required. Again, no indication is given in this EIS as to whether this will occur.

(iv) Amphibians.

Most environmental domains are unsampled or undersampled. No indication is given as to whether this situation will improve.

(v) Invertebrates.

The NSWFC is again misleading in its quotation of sections of the JSC report. It states "the AES [Australian Entomological Society] points out that harvesting can affect forest litter fauna and aquatic invertebrates, and stress the importance of leaving filter strips along each watercourse to alleviate many of the problems."

Two points:

(i) the AES has provided a much more detailed analysis of the importance of invertebrates than the glib summary provided by the EIS;

(ii) the AES report states "good forestry practice of leaving a broad channel of undisturbed native vegetation along *every* [my emphasis] watercourse (including seasonal and ephemeral streams) *could* [my emphasis] alleviate many of the above problems [effects of logging on *aquatic* invertebrates]. One has to query the AES's interpretation of broad and as to whether it would concur that the NSWFC practice of leaving only a 20m buffer strip is "broad". Also, normal management practices do not provide buffer strips along every waterchannel. This only occurs when the catchment of a stream reaches 30ha in steep areas, and 50ha in moderate slope areas.

The AES provided the JSC with the only documented investigation as to the occurrence of invertebrates in the EMA. This report indicated the incredible diversity found in small areas of remnant native forest within clearfelled areas (for pine plantations). The EIS gives no indication as to further research work in this field. Further it states that the JSC "saw no reason to believe that an integrated system of ecological reserves, coupled with sympathetic forest management, would not be an effective regional conservation strategy for these animals." Presumably the JSC must have post graduate experience in forest entomology.

#### SPECIFIC FAUNA SURVEYS.

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#### <u>Koalas.</u>

It is interesting to note that the NSWFC has discovered a large data bank (p.52) of koala sightings since the 1990 EIS, where "only one koala has actually been sighted during formal fauna surveys in state forests". This is despite the provision of a number of reliable sightings to District Forester, David Ridley, by local resident, Heather Meek, in 1987.

The EIS states that "the definition of relevant habitat for koalas in this area will depend on further survey... It is not yet possible to target specific tree species or vegetation communities as being of particular significance to the koalas in this Region". Despite these large doubts, logging has been targetted in areas where the majority of koala sightings have occurred ie Devil's Creek catchment and Yurammie State Forest. Ecologists suggest caution should prevail, and if there is doubt as to the survival of a species, especially in a so called marginal habitat, then the area should be left undisturbed. Foresters' seem to think otherwise.

The EIS states that koalas "display a preference for young foliage, particularly that 'on more rapidly growing trees'". The NSWFC appears to be encouraged that this may allow logging of areas with known koala populations. However on speaking to the NSWFC consultant putting forward this idea (Fanning), it appears that to his knowledge this management technique has not been attempted elsewhere. At this stage it should not be contemplated, as there is still little knowledge as to what the normal requirements of the koala are in the South East. 8.

Other influences, such as roading and burning, may predispose local populations to a sudden decrease in numbers. Because no research has

occurred to date, this may already be occurring. The Koalà Summit of 1988 devotes much discussion to habitat disturbance and effects on koala populations (NPWS,1990).

# FAUNA SURVEYS OF SPECIFIC AREAS. 5.2.2.3.

The EIS states that in several specifically surveyed areas rare and dangered animals were found, or possibly occurred. However no indication is given as to the likelihood of further studies in these areas. Species indicated are those listed on Table 5.2.2c. Given the likelihood of the rapid and cursory suveys undertaken by Fanning and others, cessation of logging and systematic, detailed studies should be undertaken in these areas.

The EIS also indicates that brief site visits also occurred in specific compartments to locate rare and unusual animals. One would question the validity of such suveys, given that they were "brief", and the transitory nature of many of the animals (especially birds) located in these areas. This type of survey treats forests as separate units, rather than as an ecological unit.

The EIS implies that forest practices may benefit the Southern Brown Bandicoot and the Long Nosed Bandicoot. However it gives no evidence as to whether this is occurring, and states that research is needed. Again the NSWFC is attempting to mislead the lay public into accepting that forest practices may enhance wildlife, when in fact the reverse is likely.

The EIS states that the authors of these studies made specific recommendations, but does not indicate within the document whether they will be implemented.

#### ARCHEOLOGY 5.2.5.

Limited surveys were performed for aboriginal sites in 1990. However, the EIS states that ground visibility was poor, and hence the validity of these surveys must be questioned.

The 1986 HDA DEIS stated that it "has become apparent through the findings of the Wandella Dampier and Five Forests studies that the preferred sites for locations of major logging infrastructure such as roads and log dumps are the same areas where Aboriginal sites are most likely to be found." This EIS also stated that because of the scale of operations in the EMA, the NSWFC "should obtain and field test a predictive model for site location and likely significance for the Eden region."

The 1991 EIS indicates that a suitable predictive model has yet to be produced (p.60).

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#### MEASURES TAKEN TO MINIMISE IMPACT .

#### FAUNA 6.3.2

It appears that another broad statement will go into forestry folklore in an attempt to allay fears of the effects of logging. In reference to koalas "harvesting may benefit the management of koalas in suitable forest types."(p.64). Surveys should be arranged on an area or regional basis, rather than the ad hoc compartment basis stated in the EIS. The surveys should be long term in nature and be repeatable in methodology. Surveys should be completed and results published before any logging is contemplated. The reverse has occurred in this EIS. The type of survey I have suggested *q*_

above should also be applied to other rare and endangered species mentioned throughout the EIS, and where no indication has been given as to the nature of further research. ιU.

With respect to bats, the NSWFC again implies that its forest practices ensure survival of animals. The JSC report does not mention "tree retention guidelines... will benefit species survival in logged areas", as implied on p.65 of the EIS.

Page 337 of the JSC report gives a good summary of the effects of integrated logging on arboreal mammals. It states "Tyndale-Biscoe and Calaby concluded that the greater glider and the mountain brushtail possum do not survive clearfelling, nor do they migrate to other habitat, once an area is logged, and that the same may be true for other dependant forest species which included the feathertail glider, sugar glider, yellow bellied glider and koala." In most peoples' minds there is a fine line between clearfelling and "integrated logging" as practiced in the EMA. The report also says "given that this species is an occupant of mature forest, it is likely that integrated harvesting will be highly detrimental to local koala populations."

With respect to ground dwelling mammals "medium sized species (0.5-3.0kg) such as potoroos and bandicoots are potentially most compromised by intensive logging... most of these species rely heavily upon thick understorey vegetation in which to shelter, and to provide cover from predators while foraging".

#### FERAL ANIMALS.

The provision of a roading network within state forests provides a means for the ingress of feral animals. Foxes appear to be the most mobile and appear very quickly after roading and logging have occurred. Hence definitive evidence of the long footed potoroo was provided within fox scats. Predator scat analysis during the koala survey of Reed, Lunney and Walker (1970) confirmed the presence of the koala in Yurammie State Forest, indicating that predation may be a threat to local populations. The EIS refuses to concede that roading and logging allows the significant threat to terrestrial mammals posed by foxes (and wild dogs) to be multiplied.

#### BIRDS AND REPTILES.

It is interesting to note that the EIS assumes current management practices will be satisfactory for the maintenance of viable populations of birds and reptiles. The JSC report casts doubt on a number of assumptions of the EIS, mostly on the basis of a lack of research data.

The NSWFC assumes logging to be analagous to natural events with respect to snakes. This statement would not stand up to scientific scrutiny. The EIS states that the diamond python <u>Morelia spilotes</u> will be protected by prohibition of logging in rainforest areas. The JSC report states "the real impact of....habitat disturbance through forest management practices has not been determined". (p.194).

#### SUMMARY.

Ч.

The 1991 NSWFC EIS for the Eden Management area fails to address the scientific evidence that indicates that logging 5 000 to 6 000 ha of native forest each year has a significant effect on the environment. By ignoring this evidence the document cannot possibly consider any measures that may protect the environment from the effects of the woodchipping operation.

Small management changes have been made as a result of the JSC report, such as the provision of "special prescription areas". It is unlikely, on evidence presented in the JSC report (p.335-337), that these areas will contribute to nature conservation in the EMA.

The EIS attempts to extract selected pieces of information from the JSC report in an effort to justify current management practices. Much of the information presented by the JSC is valuable; however this information has been misinterpreted and unjustified assumptions extrapolated from it by both the the Committee and the NSWFC. The basic misconception by these two bodies is that logging can continue in its current fashion, while further research, as well as inaction continues. Both bodies do not consider the cumulative damage to local ecosystems that has occurred in the 22 years of the woodchipping project.

The EIS cites various research projects (of varible quality) that have occurred in the previous 12 months, and some recommendations of these projects, but fails to indicate if action is to proceed on any recommendations. No indication is given as to whether further work is to continue where rare fauna is likely to exist. One option not considered is to cease logging in these areas.

The EIS criticises the Australian Museum report from the point of view of wood production advocacy, rather than from an objective scientific aspect. It is interesting to note that the EIS did not consider evidence and recomendations provided by Bert Jenkins and Harry Recher of the University of New England, in their report of June 1990, which supported many of the points raised by the Australian Museum.

Overall, the 1991 NSWFC EIS is not an environmental impact statement. It is a document which attempts to justify the current management practices of the NSWFC, which are prejudiced primarily by the contractual need to provide Harris Daishowa with 530 00 tonnes of woodchips per annum, and only secondarily to provided local sawmills with 65 000 m3 of sawlogs each year. The document only considers in a cursory nature the significant effects occurring to the local environment in the name of "sustainable development".



Forest Rescue

c/o P.O. TOWAMBA 2550 ph. (064) 96 7156

25th March, 1991.

The Secretary, Forestry Commission of N.S.W., G.P.O. Box 2667, SYDNEY. N.S.W. 2001.

Dear Sir,

The following is a response to the Forestry Commission of New South Wales' 1991 Environmental Impact Statement.

The easiest way to briefly sum up the Environmental Impact Statement (E.I.S.) is to conclude that it is not an E.I.S. at all but rather, "A Justification of the Proposed Activity". In fact, no forest values will be protected adequately and in the long term continuous intensive maintenance of numerous roads and vast areas of dense regrowth are not considered.

<u>VALUES CLASSIFICATION</u>: The forest is a whole unit of value. Each part is absolutely dependant upon every other part to maintain ecological balance. The forest as a whole ecological unit is self sustaining - its parts are not. The Forestry Commission declassifies this unit due to their inability or desire not to shift their perspective away from "colonial style architecture" to a global ecos view as generally accepted by progressive "multi-paradigm" scientific minds of today. The Commissions' declassification of this unit value into fragmented "appropriate" units of value is based upon immediate social and political needs and must further degenerate ecological

#### APPROPRIATE E.I.S. TOPICS.

(a) <u>REGENERATION</u>: In objectives of proposed activity (pg3) it is stated, "-to ensure suitable regeneration of those parts of the forest which have been harvested". In our own surveillance of previously harvested areas in Coolangubra Forest, it is obvious that regeneration is stifled by compaction of soil, excess debri and infestation of weeds. Weeds are now spreading rapidly through the forest due to the construction of Wog Way. Details are available in our Forest Watch reports.

(b) <u>WILDERNESS</u>: The E.I.S., in referring to the Museum Report, (pg30) states, "The report says that logging brings about essentially permanent changes in the distribution and abundance of plants and animals and destroys wilderness values. The latter is probably correct given the generally held definition of wilderness." and later states, "The report concludes that wilderness is not protected in the area. It takes no account of the very large area of wilderness in the south-east, and of the doubtful claims of "Coolangubra Wilderness" in terms of generally accepted wilderness definition." The Commission fails to define wilderness in their own terms and explain why the generally held definition is not acceptable. They also do not explain "-the very large area of wilderness in the south-east" and have also rejected wilderness claims made by the National Parks and Wildlife Service and the Heritage Commission.

(c) <u>EDUCATION</u>: 100% of the forest is potentially an educational resourse, yet only 17 hectares is accorded status. Little emphasis in this area reflects the non-committment by the Commission to offer alternatives to logging particularly in little studied old-growth areas.

(d) <u>RECREATION</u>: As with education 100% of the forest is potentially of value but little incentive is provided to the general public for such use. Just 55 hectares is accorded recreation status.

(e) <u>SCENIC VALUE</u>: All untouched native forest is of scenic value. Widespread integrated logging will obviously destroy the scenic value of the forest. Commission classification of this value is ambiguous, seeming to be only relevant to perspectives from roadsides.

(f) <u>FAUNA</u>: The Joint Scientific Committee has identified gaps in a number of important areas. Included in its recommendations is (App. 4), "further biological studies should be undertaken in those areas of forest not already surveyed so that places of high conservation value can be identified." The 1988 E.I.S. maps of Vegetation and Fauna Habitat Types clearly indicate the lack of surveys completed in Coolangubra Forest.

The Commissions excuses for logging in a number of areas, particularly the Coolangubra and Tantawangalo Forests, appears to be based on very crude assumptions rather than expert scientific analysis, for example, (pg 47) "The Australian Entomological Society notes the 'endemic higher taxa are the groups most likely to be lost through logging operations since they live in those habitats which take longest to develop." It stresses the extreme lack of knowledge at the taxanomic level of the very diverse fauna of eucalypt forests and the need for more research." No previous or current entomological studies exist according to Table 4.5.5. The Commission assumes "that an integrated system of ecological reserves, coupled with sympathetic forest management" would be "an effective regional conservation strategy for these animals" however, such a strategy, with its lack of research and hit and miss basis, is no strategy at all and would have to be to the detriment of these animals.

(g) <u>HYDROLOGY</u>: The Commission does not offer any long-term analysis of water quantity or quality beyond a few years. They appear to have overlooked the effect of sudden sedimentation of creeks on aquatic fauna, despite an 150% increase at Yambulla as stated on page 59. Tributaries of Reedy Creek continue to heavily silt six months after clearing of forest for construction of Wog Way.

(h) <u>WILD FIRE</u>: It is clear to the observer of old and multi-aged

forests that severe damage has not been inflicted by recent and not so recent wildfires, rather, greatest damage is evident in logged and roaded areas, particularly near the coast. Roads and dense regrowth are principally the main cause of wildfire in that a complete unbroken canopy is the most effective shield against the elements necessary to precipitate wildfire.

Cutting out "strips and blocks" from this protective shield on such an extensive scale must increase the amount of sunlight and wind tunnelling through these gaps thus having a drying effect on the forest. This, coupled with dense regrowth along roadsides and in harvested areas, must create an extremely volatile situation exacerbated by the wind tunnelling effects of roads. It is hard to see how roads would be a positive defence against wildfire as stated on page 24.

<u>CONCLUSION</u>: The Forestry Commission is unable to manage the forest in a sensitive manner. It ignores most sources of scientific opinion, accepting only results from a committee that was stacked five to one in favour of Forestry interests.

Studies are lacking in a number of important areas including the Greenhouse Effect and climate change on a local scale.

Consideration of the direct and immediate impact of logging on fauna and flora is lacking. Current logging practice is violent and totally, at odds with the gental harmonics of nature. The Australian people generally abhor violence, however expensive, glossy promotion veils the truth from public eyes.

Please consider the interests of the many thousands of people who have voiced their concern over the continuing destruction of the few remaining wilderness areas and plead for them to be left alone from unnecessary human disturbance.

Yours faithfully. Kussell Grand.

for FOREST RESCUE.

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# COMMENTS_BY_ROLAND_FOR_INCLUSION_IN_THE_TCPA_SUBMISSION_ON_THE 1991_FC_BIS

# SOCIAL_IMPACT

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The 1991 FC EIS does not contain any analysis of the social impact of logging and roading activities in Devils Creek. Given that such activities will have a major impact on the rural community based on the Tantawangalo and Candelo area, and on a much wider public because of the plan to log koala habitat, then full social impact analysis of the proposal is required to fulfill the proponents obligations under the Environmental proposal is completed this EIS does not meet the requirements of the legislation and the Determining Authority, which in this case publish another Draft EIS for public comment.

# HYDROLOGY_AND_SOLL_EROSION

The Forestry Commission of New South Wales EIS of Feburary 1991 is deficient in its consideration of the significance of the impact of forest harvesting and roading on catchment hydrology and soil erosion. It is well known that the granite soils of the region are highly erodible and that soil erosion constitutes a major environmental hazard. In a report to the Bega Valley Shire Bombala, Mr. C. Marshall, described the Devonian granetoid soils of the region as having 'a high to very high erosion hazard if

The EIS produced by the Forestry Commission does not adequately address soil erosion and virtually dismisses it as a hazard, the Forestry Commission has not produced any evidence of a single definitive study of soil erosion having been completed in the woodchip concession area. This ommission is one of the major

The 1991 EIS contains proposals for major logging and roadworks in the Devils Creek catchment but dismisses any impact this may have on water quality and quantity. There is also no evidence of any understanding of the significance of Devils Creek as a water supplie for the rural community. It is an outright misrepresentation of the facts to state, as this EIS does that the Creek is only important for a few rural users. The correct situation is that during times of drought the main flow of the Tantawangalo Creek is diverted to the coastal towns via the water supply weir and the a great number of rural users are totally dependent on Devils Creek, which enters the Tantawangalo Creek below the weir. Any EIS that proposes to alter the catchment in any way should as a minimum have a proper hydrological analysis of the importance of Devils Creek to the regional economy.

# Adequacy_of_filter_strips

The reason given in the EIS for the <u>assumption</u> that bedload does not enter streams is that it is prevented from doing so by filter strips of natural vegetation that is left intact along watercourses. However, Dr. Diana Day, a hydrogeomorphologist and presently Senior Research Fellow, Centre for Environmental Management, University of Newcastle, stated in a consultancy

report of November 1987 commissioned by the Tantawangalo Catchment Protection Association, that:

'Bedload transport and distribution is a high function of discharge, and particularly extreme precipitation and runoff events. If any land cover is disturbed a likely rise in runoff volumes will move more bedload for the extreme runoff events.'

Dr. Day also stated that the claim by the Forestry Commission that filter strips and logging debris comprise an effective barrier to increases in suspended and bedload quantities has no substance and concluded that:

'The statement is at variance with geomorphic and engineering. principles.'

#### Unconsolidated_sediments

The problem of unconsolidated sediment accumulating in the coupes following logging that could be released into the streams during extreme events such as heavy precipitation following wildfire has not been addressed in the EIS despite the scientific evidence presented by Burgess, J.S., <u>Sediment_yield_change_following_clear</u> <u>fell_logging_and_wildfire_in_dry_sclerophyll_forest_in_southeast</u> <u>New_South_Hales</u> Occasional Paper No., 45, Department of Geography, University of New South Wales at Royal Military College, Duntroon. 1984.

Another major cause of sedimentation is the extensive network of roads that comprises the essential infrastructure for integrated logging. The EIS fails to present any scientific justification

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given for this major environmental impact of roads. Roading is only briefly discussed and in the most general terms. This must be regarded as a major deficiency given that long term studies of the problem have been carried out by the Melbourne Metropolitan Board of Works and that those reports are available to the public. This Board, in its <u>Mater_Supply_Catchment_Hydrology</u> <u>Metropolitan Board of Works</u>, Report No. MMBW-W-0012, 1980 page 22

'Preliminary data from the study show that unsealed road surfaces generate some 40 000 kg/ha/annum of sediment compared to less than 500 kg/ha/annum from undisturbed forested catchments, that is an increase in the sediment production of 80 times.'

# Catchment_hydrology

The results of the Yambulla studies are used to discount many of the adverse impacts on water quantity and quality. However, there is grave doubt on the validity of the Yambulla studies because in Appendix 6a, within Appendix 1a of the FC 1988 EIS it is stated that the short period of the study combined with the fact that it took place during a drought leads to it being

Notwithstanding these acknowledged shortcomings, the FC continues to quote the Yambulla study as showing that turbidity (used as a measure of erosion alone instead of in conjunction with bedload as should be the case) increases following logging and roading with an apparent return to normal within five years. Quite apart from the possibility of this being an erroneous assumption, it also overlooks the cumulative impact over 40 years as each logged continuing addition of material is then started again as the logging enters its second 40 year sycle. This serious cumulative environmental impact is not addressed in the EIS.

Of great concern is that no EIS prepared by the Forestry Commission has responded to, or even acknowledged the existence of, critical scientific evidence presented by two eminent Australian hydrogeomorphologists who have worked in the south east forests showing that the experimental design of the research quoted by the Forestry Commission to justify its proposal is fundamentally flawed. <u>Olive_LJ__Rieger_H_A___Problems_in</u> <u>assessing the impact of different forestry practices on coastal</u> catchments in New South Wales_in Marner_R.F___(ed)_Fluyial ROLAND064932259 FAX

<u>geomorphology in Australia. Academic Press. 1989</u> casts serious doubts on the validity of the paired catchment methodology used in the Yambulla studies to determine the impact of logging on water quality and quantity.

# Soil structure

A further deficiency in the EIS is the lack of scientific evidence about the impact of logging operations on soil structure and its consequences on catchment hydrology. In Appendix 6a, located within Appendix 1a of the FC 1988 EIS it is stated that:

'Preliminary results show that logging destroys soil macropore structure and causes the soil surface to become sealed, thereby reducing infiltration and significantly increasing overland flow (Moore et al technical notes in preparation) '

However, this serious environmental impact has been ignored in both the 1990 and the 1991 FC EIS's. PAGE 04

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TION ROBERTSON FREDERICK JORDAN (MAMBERS 233 MACQUARIE ST SYDNEN

Dear Tim Enclosed is a wad of further information on the South East Forests. A few points :-() The Reports of Fanning (EIS bibliographin) are at present unavailable to the public & the NPWS. I was given up, bal assurance at the Eden office that they would be supplied - I think it was vetoed from higher up. 3 The EIS has used excepts of the Joint Scientific Curunitlee Report extremely selectively k out of context on several occusions. Some quotations appear to be inserted solely to buch up current management practices & are misquoted/ easily misconstaved (3) The NSWFC sent EIS submissions to Up Planning Dept on Wed 27th March. I'm not sure how many submissions they have received. Still to come: -

My summaries of relevant journal achieles on Forest munagement (this couring weekend)
Jim Burgess, Dept. of Geography, Aust Defense Forces Academy on hydrological aspects of Els

3 Australian Entomological Society Report to Joint Scientific Committee & subsequent comments from CSIRO Wildlife & Ecology (Chris Margules prepared to be subpoened) ( Graham Rylie , Arst. Museum (hopefully) with comments on Els (has just returned from sabattical) (5) Tony Norlou's commentary on EIS ( he's away in the field ut present until April 15th ). I'm not Sure how he's going with his advice - did promise it by end of Mark-pehaps he's sent it to you? 6 Literature review on effects of control burning -does it or doesn't it work? . Hope fully something environmental effects (via Saxon & NPWS) Οh D Requested articles From EIS bibliography. (humble) My opinion of Avenues of EIS challenge: -Fire (S6000 ha burning program)  $(\mathbf{r})$ Habitat Fragmentation / biodiversity (ii) Invertebrates & role of forest nutrient cycles & ecology  $(\overline{u})$ Greenhouse (iv) Effect of terrestrial /acboreal mountails (cl (1) studies of Lunney, F.C. Research note 42 Rether, Potoroos, Koalas)

(Vi) Miuroorganisms Enutrient dynamics (e.g. mycorrhyzal fungi e terrestrial mammals effect of fire / logging on these)

(Vii) Anheology - F.C shill doesn't appear to have a field lested model for predicting sight or whence.

(viii) Hudrology - effects of roading - unreliability of trial already undertaken - short-term nature of trials to date & interference of drought

I hope these are of interest to you. I'll ring you Friday' p.m. to see how you are situated for time etc.

Regards Stil Jegos

STEPHEN JALOE

OUR REF BSW 2501/0

#### YOUR REF

DATE 7 March 1991

> Mr T.F. Robertson Barrister DX 450 SYDNEY

Dear Tim

#### SOUTH EAST FORESTS 1991 ENVIRONMENTAL IMPACT STATEMENT

I enclose extract from Eden 1991 EIS given to me by Steven Jago. He has written in pen the compartments which are covered by the 1991 EIS but which have not been previously covered by an environmental impact statement.

Steven Jago is contacting Tony Norton, Harry Parnaby and Dr Diana Day concerning possible expert statements. I note that you were to discuss the same with Dr Recher. Please let me know the results.

Yours sincerely

Bruce Stephen Woolf

Encl.

# WOOLF ASSOCIATES SOLICITORS

10th Fl, 82 ELIZABETH STREET SYDNEY NSW 2000 . TELEPHONE (02) 221 8522 FACSIMILE (02) 223 3530 DX 1558 SYDNEY

BRUCE WOOLF BA LLB Dip URP

ASSOCIATES: BRIAN HILLMAN LLB. Dip B Admin. Dip S de Fr des Aff EDWARD L. MURA B Ec. LLB.

NB. Ju 1991

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# EDEN 1991 BIS APPENDIX 1 SCHEDULE 1 SUMMARY OF HARVESTING AREA DESCRIPTIONS

1	HARVESTING AREA	S.F. No.	ROAL	) CONSTI	R.(kn)	C0	NSTITU	1101	OF CO	DNPARTN	BNTS TO B	B HARVESTI	BD	PER	CERTAGE RY TO B	OF SLO	PE	BARVESTING PROSION C	AREA BY
	No. Name	- Section	Fore Comp Cl.1	estry 1. CI.3	Con trac tor	Prev. Harv. Coupes	Coupe: Retain	s 1991	No. upes	Net Area Harv.	Reserve in Coupe	Reserve ex Coupe	Gross Area Cpts.	0-10°	10-20°	20-30	30+0	Average	Bigh
			£ 2			(99)	(ba)	New		(ha)	(ha)	(ba)	{ha}					(ha)	(ha)
1	Murrabrine	SP947 Verona	0.	0	5	0	205	3	6	302	84	13	605	48	59	48	0	0	302
2	Nurrah	SF140 Quaama	0 1	0	0	· 0	0	1	1	185	115	0	300	62	62	60	0	185	0
3	Mumbulla	SF605 Kumb.	0	0	9	. 0	289	9	10	941	22	10	1262	75	81	54	100	941	0
5	Nth. Glenbog	SP149 Glenbog	0	0	1	0	189	2	. 4	141	0	61	391	42	29	0	. 0	141	0
8	Bredbendoura	SF134 Glenbog	0	8.1	8	0	514	4	10	317	16	213	1060	30	30	68	2	317	0
13	) Yura <b>nn</b> ie West	SF134 Yuram.	0	10.4	2	0	179	2	3	127	12	12	330	43	30	40	40	0	128
-1(	Lennards West	: SP545 Lenn.	0	0	1	0	160	1	3	92	2	36	. 290	98	97	100	0	92	0
16	5 Jingera North	SP545,132 Jingera	0	0	16	0	397	5	11	391	4	380	1172	56	41	43	0	457	335
17	Jingera South	SP545 Jingera	0	0	4	0	264	2	3	.156	28	+ 47	495	29	36	30	0	156	0
17	a Jingera West	SP545 Jingera	0	1.7	0.5	0	52	1	1	39	5	26	122	70	28	41	0	0	. 39
18	Palkner North	SP126 Falkner	0	0	21	33	1239	16	22	1066	29	248	2615	48	41	29	0	145	920
19	🛛 Palkner/Waal.	SF126,131	0	0	17	0	796	12	18	854	28	267	1945	39	66	44	0	0	854
20	Cathcart	SF607 Coolang	. 0	0	11	0	508	10	19.	408	132	114	1162	48	39-	25	0	335	73
21	Coolangubra	SF547,130 Coolangubra	0	0	9	0	304	5	8	243	178	39	764	41	28	29	0	0	243
22	Nalbaugh	SF129,547 Coolangubra	0	5.4	6	0	331	4	6	177	44	0	552	33	27	45	0	97	80
23	Rockton	SF128 Rockton	0	0	19	0	306	9	15	441	79	40	865	49	53	64	0	109	332
25	Pericoe	SF547 Pericoe	12	46.2	.29	0	1836	21	40	1435	451	63	3785	48	36	24	0	140	1295
-		·	12	71.8	158.5	33	7570	<u>1</u> 371	80	7315	1229	1569	17716	-	_	-		3116	4601
26	Thioning	SF126,127,545 Bast Boyd,Alan Brook,Falkner, Jingera	15 <u>*</u> 1	0 Dropose	14.5 d recon		- . of R	drom	- Road	840 (Prima	-	5814	6654	-	-	-	-	680	160

(* proposed reconstruction of Edrom Road (Primary Access Class I)