ROBIN / TIM / LORIS

PROPOSED FOREST MANAGEMENT PLAN
MIDLANDS F.M.A.

Comments by N.D.Endacott (31/3/96)

Introduction

I wish to offer my comments and criticisms of the Plan under two major categories:

A) Specific comments on individual sections in order of occurrence

B) Other matters of considerable moment.

These are:

1) Failure to project a Forestry Vision for these very valuable and significant forests.

2) Failure to lay down or foreshadow a framework for the achievement of Best Forestry Practice.

3) Comments on the 1994 Shelterwood Review, in relation to its impact on the Plan.

4) Comments on certain aspects of the i995 Sustainable Yield Review (S.Y.Review), and their impact on the Plan.

N.B.: Regarding B)3&4, these documents were never put before the public in draft form for public comment, as is common practice with so many other reports of such importance. Perhaps it was considered that they had such a high technical and scientific content that such procedures were inappropriate.
Their findings were reverently embraced and incorporated in the Plan.

Therefore, in the context of commenting on the Plan, I think it is fitting that those two documents be now subjected to some public comment.

I have tried to make all necessary cross-references between the many sections of this paper, to minimise tedious repetition.

A. SPECIFIC COMMENTS

CHAPTER 2.

2.1 ZONING SCHEME (Pages 4-5)

Maximising Increment within SMZ and GMZ

The Plan fails to express clearly and with emphasis the primary

obligation of the forest managers to achieve maximum volume increment, per hectare and in toto, within the area allocated to timber production, and having regard to the environmental constraints imposed by the Plan.
This point is pursued under 4.1 Hardwood Timber Supply.

Improvements Recommended for Table 1.

A different arrangement is suggested for the section of the Table covering SMZ, GMZ and the two subsets, e.g.:

Special Management Zone	30,300		
Timber Production		....	
Other Uses		....	
Total		30,300	
General Management Zone	60,800		
Timber Production		....	
Other Uses		....	
Total		60,800	
Total Net Productive Area			50,500

Accuracy of Figures

The area figures are rounded off to the nearest 100 ha. This gives the impression that this resource statement is "rough and ready".

Boasts are made about the extreme accuracy of current remote sensing, cartography and GIS technology. Therefore it should be possible to present much more detailed figures than shown in Table 1.

The figure for N.P.A. is given as 50,500 ha. in Table 1., but on Page 30 as 50,450 ha. This disparity should be eliminated.

The many resource statements over the past 40 years have presented conflicting sets of area figures. One had hoped that with all the new technology, this Plan would have laid to rest all these confusions and irritations and produced the final definitive area statement. To this end, I had hoped for a detailed tabulation of both area and volume inventory, dissected area by area. But it seems that I am to be disappointed.

2.3 SPECIAL MANAGEMENT ZONE

No information is presented regarding the physical details of the restrictions to be placed on logging within SMZ, nor is any attempt made to quantify the resulting reductions in yield. The 1995 SY Review in Sec. 10.3 does attempt estimates of the impact of Powerful Owl and Designated Catchment constraints, but one does not know how these were arrived at. The East Gippsland FMA Plan gives a rule of thumb that yields within ~~its FMA~~ its SMZ may be impacted to the extent of 50% by the application of flora & fauna measures ~~in SMZ~~. But that Plan has a much more extensive suite of species to receive F&F protection. On the other hand, in East Gippsland the SMZ comprises only 6% of State Forest, whereas in the Midlands, SMZ comprises 27% of S.F. overall, and when one looks at Wombat, the SMZ more or less equates in area with GMZ.

Therefore I see the SMZ as a serious potential threat to timber yield, if unbridled restrictions and reservations are imposed on SMZ harvesting, without any regard to the economic consequences.

Therefore I suggest that it is important that the Plan gives a full and frank explanation of the restrictions to be imposed within SMZ areas. The half page given under 2.3 (Page 7), with such bland statements as: "considered on a case-by-case basis" and "operational detail undertaken at the local level", is too vague and inadequate.

CHAPTER 3 BIODIVERSITY CONSERVATION

3.2 Management of Threatening Processes

Loss of Hollow-bearing Trees

In 1983 I made a submission on the Plan's First Draft. (Endacott 1983). See Appendix **1** . In this I tried to rebut the fallacious belief that Midlands forests would have a sufficiency of hollows if only forest management would allow the forest crop to grow old enough before harvesting.

Within the NPA, where forest management for timber production has a priority role, it is the forester's traditional task to regenerate, nurture, tend, thin and protect his/her growing stock and bring it to maturity in a vigorous, healthy and defect-free condition. Any stem defects such as could have a causal association with faunal hollows would normally be eliminated in the thinning process long before maturity is reached. The achievement of maximum clear bole length in the final crop trees means that any potential cavities will generally be confined to the adventitious dying and breaking off of major limbs within healthy crowns. The actuarial frequency of occurrence will be of a very low order, especially with the major species - Messmate. Even if rotations were extended to 200 years, the production of hollows by a well-managed, vigorous Messmate forest of good form and health would fall far short of that of an unmanaged forest of equivalent age, in fact would be minimal.

The traditional remedy of the Code of Practice for this paucity of hollows within coupes is to leave up to 3 alleged habitat trees per ha., dispersed through coupes. A large proportion of these trees is perforce Messmate. The yield of hollows per ha. from this source will inevitably be small and not commensurate with the loss of valuable growing space and the suppression of regeneration and regrowth incurred.

What this Plan needs is an honest admission that the present practice of retaining small numbers of evenly dispersed "habitat trees" is of dubious effectiveness, and the foreshadowing of a review of the strategy, along these lines:

1) A scientific study of the oncology of hollow-formation in the Midlands context, supplemented by a review of the literature from other areas.

2) A study of the population dynamics of the main species of concern, and the desirable and minimal levels of hollow availability. This would include the merits and demerits of dispersion versus aggregation, and the contribution made by the reserves juxtaposed with coupes.

3) An audit of the effectiveness of past habitat tree retention - a genuine sampling, on a tree-by-tree basis, of the yield of effective hollows on trees reserved for that purpose over the past 20 years or so.

4) An intensive study of the downside of habitat tree retention - the magnitude of the the inhibiting effect of veteran overstory trees on regeneration and regrowth. (This study would be closely related to the recommended study of the effect of retained overstory, vis a vis Shelterwood System.) Assessment of opportunity cost of retaining habitat trees.

5) Development of a set of firm criteria for individual habitat trees, as guidance for tree markers.

6) Introducing discipline into the habitat tree marking process - distinct marking of each tree, recording of details on coupe report, and attaching accountability to the tree markers.

7) A scientific, practical and economic study of the feasability of supplementing limited natural hollow availability with an artificial hollow programme for strategically-chosen locations within coupes and adjacent reserves. See my earlier submission - Endacott 1993 (Appendix 1 of this submission).

Regarding the 3rd Dot Point under your "Action" heading (Page 16). I strongly oppose the idea of recruitment of another generation of habitat trees, within coupes.

This concept virtually proposes an additional management regime within the NPA, operating in parallel with the traditional sawlog production regime, with the objective of producing in perpetuity a "crop" of refuge/nesting hollows.

This would make serious additional inroads into the wood productivity potential of the NPA.

3.3. Species & Genetic Diversity

Management of Rare & Threatened Flora (Pages 19 - 22)

I would draw your attention to the small disjunct occurrence of Eucalyptus sieberii on the Pyrete Range. Included in the ground cover is the rare Boronia pilosa and Tetratheca stenocarpa. See L.C.C.1987.

None of these species are included in your Table 5.

The E. sieberii is separated from all other Silvertop occurrences by such a great distance that it must be considered genetically important. Should the Department ever wish to include Silvertop in a genetic tree improvement programme, this particular provenance could be of value.

Conservation Guidelines - Birds (Page 26 & Appendix E)

The major concern is obviously the Powerful Owl

It has acquired such importance that the single page of background information and conservation action in Appendix E would seem inadequate. There should be a suite of references from the

literature included in your Reference Section.

Details of the sightings and records should be given, and the 25 locations should be shown on the maps.

Some observations and comments would be useful on the relationship between timber harvesting and owl survival, having regard to the fact that a fairly uniform level and intensity of harvesting has been operative for almost 50 years, and despite this activity this raptor seems to be a good survivor at the present Midlands population level. The logging restrictions provided for in Appendix E should be justified and supported by the above recommended account of the bird's needs.

Chapter 4. TIMBER PRODUCTION

Introductory section (Page 28)

Regarding the historical middle paragraph, and the First Dot Point. The mid-1970s picture was that of a fairly homogeneous forest composed of well-stocked more or less even-aged mature and near-mature stands (except for the discrete Barkstead/Eganstown fire regrowth area).

Over the ensuing 20 years, this homogeneity has been progressively broken down. Theoretically, a complete 20 year series of annual regrowth classes has been created, and this process will be extended into the future until the mature forest has been completely liquidated.

In reality however, by virtue of patchy regeneration outcomes from Shelterwood and indecisive harvesting activities, a very messy heterogeneity has been created. When it comes to yield regulation, the application of state of the art resource assessment techniques has been found to be necessary to bring some order out of confusion.

Regarding the 6th Dot Point.

. The CSR operation was the result of joint planning by the Forests Commission and the Company, with the specific objective of utilizing the unused sub-sawlog wood currently available in the Wombat and adjoining Midlands forests. To express this slightly different shade of meaning would be to help in the present woodchip controversy.

. No similar reference is made to the establishment of Midway. I can see no reason why similar favourable comments could not be made about Midway's operation. Historical accuracy and completeness would demand this. (see later, under Residual Logs & Pulpwood - Pages 31-32)

Regarding last paragraph.

. CNR's major responsibility is better expressed as "productive forest management", rather than "involvement in timber production".

. I have strong contrary views about the "suitability of current harvesting and regenerating methods". As I indicated in my Introduction, I am pursuing this further in my B)3&4.

4.1 Hardwood Timber Supply

First Paragraph (Page 29)

. Probably the word "optimize" is intended to signify the co-existence of productive forestry with environmental protection, and the consequent need for compromise. But for me it has also connotations of relaxation of productivity standards (e.g.passive acceptance of 1.5 - 2.0 m3/ha/yr.MAI), failure to press for best forestry practice, and unquestioning submission to measures that would reduce the NPA without full examination of implications.

The use of "optimization" in the 5th line, which governs the following four Dot Points, is especially inappropriate.

"Maximize" was used as an imperative within the "Management Objectives" of the first two Wombat Management Plans in the 1970s, but was (apparently inadvertently) omitted in the 1982 Plan. There is no justification for its omission today.

I would prefer the use of "maximize" wherever possible, in the context of foresters striving to achieve maximum wood production in perpetuity from a finite productive area, after having made the requisite provisions for conservation.

It is noted that the Plan uses "maximize" at the bottom of Page 29, in relation to the proper grading of harvested volume, and on Page 39, in the context of regrowth thinning treatment. Under 4.2 (Page 42), "maximise sawlog yield" is given as an attribute of a successful harvesting & regeneration system, which is commendable.

First Dot Point. See my later Sections B)2&3.

Second Dot Point. See my later Section B)2.
The word "adequate" is rather weak. I would prefer: "ensuring complete stocking of seedlings of preferred species on harvested areas, to rigorous criteria."

Second Paragraph (Page 29)

First Dot Point. This statement seems incorrect, in that top billing is given to furniture and cabinet-making, which must be fairly low volume end-uses. A more detailed and accurate statement of end-uses for lumber from Midlands forests would seem desirable. (See later -under reference Page 32- recommending a simplification and clarification of the forest produce grading system.)

It would probably be worthwhile to give a summary of the 1988 Log Grading system as an Appendix, as the SY Review has done.

Last two Dot Points. Here the Plan only specifies:
Residual Logs going into lower-grade sawn products,

Wood Chips from mill residues, going to Midway at Geelong,

Pulpwood going to Bacchus Marsh.

There is no mention of the alternate use of residual logs as pulpwood in times of market downturn, nor pulpwood per se going to Geelong.

Aims
Here again the anaemic word "optimize".

"Maximizing the utilization of sawlogs..." is a little unclear. Is it referring to good log grading practice? Or is it referring to the elimination of the types of waste or loss identified by the SY Review?
See my later sections B)2&4.

Sustainable Log Supply (Page 30)
The reductions in annual sawlog cut are derived from the 1995 S.Y.Review. For my comments on that document, see my later Section B)4.

Residual Logs & Pulpwood (Pages 31-32)

Second Paragraph. This identifies pulpwood as the product which provides the furnish for CSR Wood Products at Bacchus Marsh.

It identifies logs and sawmill residue as the two products which allegedly provide the basis for Midway's chip export business. No mention of "pulpwood", which is puzzling.

Third Paragraph. Regarding the sentence in the middle: "By selecting specific forest areas..." I would question whether in the routine WUP coupe planning processes, pulpwood/log ratio is an important influence to be factored into coupe allocation. So much complexity has been built into the system, to do with percentages of species and log grade, wet and dry weather, seed availability in the tree crowns, and now a raft of new catchment and environment considerations, that I would be surprised if any more flexibility is left for considering pulpwood yields. I suggest that the only areas where this factor is a consideration are the degraded stands which are being considered for silvicultural rehabilitation, and which have very low multiples of log:pulpwood.
In the case of normal coupes where the log:pulpwood multiples are say 1:1.5 to 1:2.5, I would suggest that because the background wastage of pulpwood is so high, this acts as a buffer against the waxing and waning of the pulpwood market.

Fourth Paragraph. The thrust of this paragraph is very commendable- to emphasize the silvicultural benefit attached to the fullest possible harvesting of the available sub-sawlog quality material. However, it is suggested that the space devoted to this exposition could well be increased three- or fourfold.
The green movement has had success in demonising pulpwood harvesting; the FMA Plan could well use its imprimatur in giving a thorough explanation as to how the public good is served by a well-managed pulpwood harvesting programme, integrated with and peripheral to the core sawlog management operation.

I would question whether your target figure of 50 tonnes/ha. maximum of logging slash is low enough.

Fifth Paragraph. (Top of Page 32). Here again we have the ambiguity already picked up on Pages 28 & 29, regarding CSR & Midway, Residual Logs & Pulpwood. Why is the reader given the impression that pulpwood goes to Bacchus Marsh, and residual logs go to indeterminate destinations (possibly including Midway, but not specifically stated.)

The terminology in reports and documents (such as this Plan) relating to sub-D class log material has become arcane and thoroughly confusing. Sub-D class wood is variously called "Residual Logs", "Residual Wood", "Residual Roundwood", "Pulpwood" and "E-class Logs". I understand that the usage has "grown up like Topsy", with its origins in the CSR Pulpwood legislation and various events in the 1960s and 1970s, compounded by the 1988 log grading system.

I think the time has come for starting afresh with a review of the whole range of forest products, logs and pulpwood alike.

The borderline between the lowest category of log (class D or E, whatever) AND PULPWOOD should be redefined clearly. All "logs" to go to sawmills, and such utilization should be compulsory on coupes. The word "logs" should never attach to material going to Bacchus Marsh or Geelong. All "logs" should appear as such in management production and financial records, and industrial wood should be recorded as "pulpwood."

4.2 Harvesting & Regeneration Systems

First Dot Point. As suggested with reference to 4.1(Page 29), "adequate" is not an adequate word in this context, and "correct" smacks of political correctness. I draw attention again to my preferred wording: "ensure complete stocking of seedlings of preferred species on harvested areas, to rigorous criteria".

Second Paragraph, Page 33. I have three criticisms of this paragraph:-

. The first sentence as it stands lacks useful meaning. Incomplete and inadequate regeneration stocking can still result in sustainable timber production, but at low levels. If the expression "...sustainable maximised timber production" were used, the sentence would then have meaning.

. The words "of the required type" are ambiguous. Is the reference to species? quality? or lignotuber coppice or seedlings?

. I assume that the claimed 96% success figure was copied from the SY Review 1995, originating from Fagg et.al.1994, and relates to Statewide results.

If so, the figure should be 89.8% all types pooled, or 95.4% LEMS. If it is intended to be the Midlands component of that analysis, then the figure should be 91.1%.

Nobody involved in producing or using these figures (Fagg et al 1994, Kellas et al 1994, SY Review 1995, and now Midlands FMA Plan 1996), raises searching questions about the re-treatment of under-stocked areas - the extent and efficacy of this remedial work.

I consider all these figures rubbery and suspect, and I elaborate on this in my later Section B)3.

Application of Shelterwood etc. (Page 33)

Second para. First Dot Point. The word "abundant" is misleading. There is much seasonal variability, (especially with Messmate) and irregularity in distribution.

Second Dot Point. This glowing account is not based on reality.

Last Paragraph, Page 33. Regarding maximum coupe area.

If Shelterwood is to be retained, the condition and productivity of the retained overstory must be seriously considered. The phenomenon of exposure leading to crown attrition has been identified by Kellas et al 1994, and also East Gippsland researchers. This disability has been linked with large coupes and exposure to wind.

In my submission in favour of clear felling- Endacott 1995- I have advocated clear felling in small patches of 15-20 ha. Likewise, Opie (Forest Science Group) 1994, in comments on FMA Plan First Draft, has recommended a mosaic of "variable patch silviculture", with coupes limited to ca 15 ha.

In summary, I would suggest that there is a trend in opinion away from large coupes.

There are cost and management advantages in 40-60 ha. coupes, but I suggest that the pros and cons of considerably smaller coupes be weighed up before settling on a figure. There is no reason why the Midlands should not adopt a more conservative figure than that prescribed in the Code of Practice.

Seedbed Preparation (Page 34)

The recent decision to delay the regeneration burn for one or two years, merely to paper over one of the defects of the Shelterwood System, is deprecated.
This practice will maintain the site in a largely non-productive condition and as an eyesore, for one or two years longer than necessary.
An equivalent result may be obtained by re-introducing the lopping of upstanding branches in tree heads by the fallers, as was practised in these forests in pre-Shelterwood days. See Endacott 1995.

Guidelines etc (Page 34)

Choice

. The foreshadowed use of the Selection System in certain circumstances flies in the face of 25 years' experience (late 1940s to 1974) when a selection-type system was practised diligently, and was finally abandoned as being incompatible with the Eucalypt species involved.

It appears that the only variety of SMZ where Selection logging would be applied would be where landscape considerations prevail. I have perused Appendix B, but cannot find any SMZ areas where such values are specified.

. Clear Felling is apparently to be used only in seriously Armillaria-affected areas. My appreciation of the position is that this is the only system completely suited to the silvicultural needs of these Eucalypt species, as well as having many other practical advantages, not the least being that it is the best method available to the forest managers of retarding the spread of Armillaria in areas where its foci of infection are widespread (e.g. Wombat).

. The Seed Tree System is to be applied to areas needing silvicultural rehabilitation.

This system falls between two stools - not enough retained trees to guarantee a sufficiency and good distribution of seed, yet

enough to result in some log wastage and/or the problem of dealing with the overstory if suppression or retardation of regeneration is to be avoided.

I cannot see any logical argument why Clear Felling with artificial seeding cannot also be used on these degraded areas.

. Shelterwood seems to be chosen as the staple system for the major part of the Midlands FMA.

I have written a lengthy submission to the Department, seeking to condemn Shelterwood and press for the establishment of a set of extensive field trials to finally determine which silvicultural system is best-suited to the Wombat Forest. (Endacott 1995).

It appears that the main elements in the Plan decision to continue with Shelterwood were the Shelterwood Review (Kellas et al 1994) and the SY Review (CNR 1995). I deal with these papers in my later Sections B)3&4.

Application (Page 35)

Intensity of Regeneration Burns. This prescription is tinged with unreality.

Delay in Regeneration Burns. I have already protested against this delay, and recommended that instead, the logging company be required to "flatten" heads, as was universal practice in the Midlands pre-1974.

Timing of Shelterwood 2. The Plan gives these justifications for a reduction from the present 15-20 years to 10 years or less: tree mortality, crown scorch, windthrow.
The 1994 Shelterwood Review gives these additional justifications:
. if retained trees fail to perform
. if retained overstory has a suppressive effect on regeneration.
All in all, it seems inevitable that in future the Removal Cut will take place 10 years or less after Shelterwood 1.

This shortening of the life of the SW1 residuals weakens the "increment bonus" concept as a pro-Shelterwood argument.
After the retained trees recover from the shock of isolation and possibly bole and crown scorch, and start producing an enlarged crown (which is the major mechanism for enhanced wood increment), the time for Shelterwood 2 is imminent.

Application of Alternative Systems (Page 35)

The ambiguous relationship between the Selection System and SMZ has already been queried. More information is required.

Rehabilitation of Degraded Forests (Page 37)

First Paragraph. The intended meaning of the word "diversity" is not clear.

Third Paragraph. The practice of encouraging seedling regeneration and selective removal of coppice is endorsed. However, I submit that

this anti-coppice programme should be universal - areas of high log production potential and degraded but potentially productive areas alike.
Except in the low volume, non-sawlog areas in the drier parts of the FMA, where coppice can be regarded as the crop of last resort and seedling regeneration problematical, coppice should not be regarded as a desirable part of the growing stock.

4.3 Regrowth Management (Page 38)

First Dot Point. I agree with and emphasize the choice of the word "early". However, this policy is abandoned when the Plan prescribes a one or two year delay in slash burning.

Second Dot Point. I agree with this. However the Plan also abandons this principle with its non-critical approach to Habitat Tree retention, and by the endorsement of Shelterwood, where, I submit, the retained overstory has a net negative effect on long term productivity.

Third Dot Point. I suggest substituting "maximize" for "optimize".

Third Paragraph. Again for the sake of historical accuracy, I suggest that the first couple of lines be changed to: "The majority of the NPA within the Midlands FMA is either regrowth forest less than 20 years old, or mature forest which originated last century or early this century, and has received two partial TSI cuts during the period from about 1950 to 1974. The only areas of regrowth greater than 20 years old ....."

Aims (Page 38) Suggest that "technically" be inserted between "environmentally" and "economically".

Pre-commercial Thinning & Fertilizing Page 38)

Third Dot Point. This suggests that it is an established fact that wildfire does deplete nutrients to the extent that artificial replenishment is necessary.
I suggest that a brief validation in the text on Page 39 would be desirable, and sources could be included in the References, notably the work of Attiwell et al.

Third Paragraph (Page 39). The last sentence suggests only a go/no go decision on fertilizing, based on environmental impact.
It seems likely at this stage that fertilizing would be proven beneficial in pure forestry production terms, and that precautionary measures could readily be applied to prevent run-off of nutrients into streams.
The sentence could well be re-phrased, so as not to appear to close off options, but to credit the forestry profession with problem-solving abilities in this area.

Guidelines for Regrowth Management (Page 39).

Pre-commercial Thinning. The objective should be to cover all the back-log, and then to keep up with current annual commitments.
Priority lists and targets are acceptable, but there should be nothing in the wording to suggest only partial accomplishment during the life of the Plan because of restricted budgets.

Commercial Thinning. I see no suggestion of non-commercial thinning (poisoning) in stands which are precluded from commercial thinning by virtue of steep terrain or other physical problems. It is noted that the Code of Practice approves of logging up to 30 degrees slope on suitable soils. Therefore there could be appreciable regrowth areas in need of thinning but which are difficult to harvest economically for small pulpwood material because of terrain.

To sound a warning note, it is worth mentioning that the current commercial thinning programme in East Gippsland lowlands, thinning dense pole-sized regrowth for pulpwood, has encountered problems in crown bole and butt damage from the operation, even on undulating terrain.

4.4 Other Timber Products

Firewood (Pages 41-42)

This is one example of the Plan's lack of Vision.

I am aware of the campaign of the Wombat Forest Society for a greatly increased emphasis on firewood utilization, and also that Midland Logging Co. has made an entrepreneurial attempt to attract interest in large-scale firewood harvesting from forest waste, in conjunction with log extraction.

I applaud these efforts. The fact that so far they have been unsuccessful does not take away from the desirability of the objective.

I feel sure that the right approach to the problem will eventually succeed, and that the existing base level of firewood sales could be doubled.

I consider that the unimaginative (AS POSSIBLE) policy of attempting to squeeze as much royalty revenue from firewood is counter-productive. $8.00 per tonne for common wood is a strong discouragement.

The existing page or so in the Plan (Pages 41-42) is merely a dull recital of the management and administrative arrangements in place to control current firewood-gathering activities. Innovative and pro-active measures should be foreshadowed.

CHAPTER 5. STREAMS & CATCHMENTS

5.1 Code of Practice etc. (Page 46)

This section seems to give scant attention to the need for diligent erosion control measures in road design and maintenance and also the work necessary on the temporary roads and tracks after coupes are completed. The Code has much detail on these matters, but some of it could well be reproduced here.

Actions. (Page 46). The last paragraph correctly suggests the present state of knowledge on water yield protection - that yield depletion because of logging does not seem to be a factor in Midlands catchment management.
Therefore it should be stated that the Plan does not envisage any manipulation of harvest planning being necessary on account of this alleged factor.

However, the section on "Regrowth Management" (Page 51) seems to take us on a somersault. It claims that harvesting may have the afforementioned effect, and manipulation of cutting patterns within designated catchments is required.

Road & Track Management (Page 52)

As in Section 5.1, this section neglects to mention the need for thorough attention to abandoned snig tracks and temporary roads, when logging is completed on coupes.

I submit that car rallies should not be permitted on Midlands forest roads outside the Summer, because of extreme vulnerability of these roads.

CHAPTER 6. FOREST PROTECTION.

Pest Animals (Pages 66-67)

Guidelines for Control (Page 67). Third Paragraph - regarding the justification for controlling rabbits, the words should be added "... and forest regeneration".

The Plan should face up to the problem of browsing by wallabies on coupes, during the regeneration phase. Research is necessary, and the political groundwork should be prepared to permit sporadic and localized wallaby destruction where considered absolutely necessary.

CHAPTER 7 RECREATION etc.

Table 12 I consider that the Department should take a harder line with respect to car rallies, by limiting them to the dry part of the year, and requiring full compensation for any road damage.

The Midlands forest roads are of fragile construction, able to withstand the stress and wear of heavy logging trucks, but not necessarily the particular stress of rally cars negotiating curves at speed. Once the integrity of the pavement is broken and normal drainage is interrupted, the formation is at risk and erosion will follow. The stream sediment load will increase and costly road rehabilitation may be necessary.

7.3 Landscape (Page 75) In the case of Victoria's extensive forests, sheer size gives enough flexibility to allocate generous areas for amenity purposes.
In the case of the Midlands, the productive area is so small and finite, and the dependent industry has during the past 50 years developed to a level commensurate with the size of the resource in those earlier days. The reservations over the past decade have been quite damaging to the sawmilling industry's economic welfare, and under the present draft Plan the belt-tightening increases another notch with 20% of SPZ, and the unknown impact of SMZ.

In the third paragraph, the fear is expressed of the public observing a "dominance of timber harvesting" during trips through the bush. I find a basic dishonesty in a feeble campaign to delude the touring public into believing that they are travelling in a pristine area uncontaminated by sordid commercial activities.

These forests have an intensive network of forest roads, nearly all of which are accessible to tourists, and all of which must, in the nature of things, periodically exhibit both the ugly and the attractive aspects of logging coupes. It is impossible to consistently conceal logging activities from the public.

The answer to this public relations problem is provided in a quotation from the third paragraph under Section 7.3 : "Harvested areas of forest and regrowth stands will therefore be a part of the experience of visitors...". Instead of trying to play both games, the Department should come down on the side of frankness and honesty, and conduct a pro-active public interpretation campaign, to inform the interested tourist that he/she is visiting a working forest, and by means of roadside information boards, brochures and other means, explain what that means.

I feel sure that the public reponse would be most positive, and obviate the need for screening off certain areas which the tourists should not see.

CHAPTER 8 OTHER FOREST USES

8.5 Apiculture (Page 83)

Fourth Paragraph. If the "studies" on the allegedly adverse effects of the Honey Bee on natural ecosystems are of scientific value, then they should be included in the Plan's References, and the authors identified. However if they are merely kite-flying by anonymous people with nihilistic tendencies, then they do not deserve mention in the Plan.

The welfare of an important rural industry is involved here. If its future is to be called into question, then all scientific protocols must be observed.

CHAPTER 9 RESEARCH & EDUCATION

9.1 Research (Pages 85-86)

The Plan should go further than merely listing the research projects currently under way. The FMA planners should be pro-active and produce a list of areas they believe should be investigated during the life of this Plan.

Research Projects I see as important (apart from those already provided for) :-

a)Development of an improved regeneration monitoring system.

b)Field trials of several well-chosen alternative silvicultural systems

c)Determination of damage done to regeneration and regrowth by overstory, including relationship between vigour and crown development of overstory and vigour of regeneration below.

d)Growth data on regeneration and regrowth, in a range of site qualities.

e)Development of a less crude and more effective technique for re-treating understocked coupes.

f)Study of crown decline and the effect of coupe size.

g)Study of BA increment on retained trees before & after SW1 (related to (f)).

h)Small-scale trial of artificial hollows for arboreal fauna.

i)Production of Completion Report on Armillaria Research Project (of ca.1970-1980).

j)Study of rabbit and wallaby damage to regeneration, and possible control measures.

9.2 Education & Interpretation (Page 87)
I have already suggested that the Department conducts an ongoing campaign to educate the public, including local and regional communities and day-tripping tourists, as to what Midlands forest management is all about.

CHAPTER 10 FOREST ROADS

The Introduction (Page 88) gives an inaccurate two line history of forest road construction.
The truth is that the construction of properly designed and planned, formed, graded, drained and surfaced all weather forest roads was commenced in the late 1940s, and the network was completed by the end of the 1960s.
Crawler tractors only became available to the Forests Commission during wartime, and dozers, power graders and other ancillary machinery in the immediate post-war years.

Prior to this period, the accomplishment was limited to a network of forest tramways (with a short life-span) and a more extensive network of unformed tracks.

CHAPTER 11 PLAN IMPLEMENTATION

In the several references to "refining management guidelines and the zoning scheme in response to new information" etc. I see danger that this may become a one way affair, limited to finding new reasons to increase SPZ and SMZ at the expense of GMZ.

In the Guidelines (Page 96), this suspicion is reinforced by Dot Points 1,2,3,4.6.7,10 and 11.

11.3 Monitoring & Reporting (Page 97)

This is given only cursory attention here. There is no focus on the need for diligence in the areas of Field Monitoring, and the Maintenance of Good Forest Records.
I will deal with such subjects in my B)2, which covers Good Forestry Practice.

B. SUPPLEMENTARY MATTERS

(1) LACK OF A VISION STATEMENT

In the Plan there is much zeal evident for the preservation of Conservation Values, in all their aspects.

However I do not detect any indication of a vision for the forestry future of these very significant and valuable forests, nor for the dependent forest product industries. In this area, the message I get is "business as usual" with a few additives, like more emphasis on "regrowth management", which is basically thinning and the use of fertilizer. Not very inspirational stuff!

In my recent submission to the Department- Endacott 1995 - I gave my perspective on the hopes and aspirations of past generations of foresters, and suggested that some of those attitudes be revived to put Midlands forestry back in the forefront of good Victorian forest management.

I find little in the draft Plan to excite the imagination. In this respect it is cast in a similar mould to the East Gippsland FMA Plan, and the Code of Forest Practices.

(2) ACHIEVEMENT OF BEST FORESTRY PRACTICE

The Code of Forest Practices is basically a one-dimensional document, concentrating on the achievement of Conservation objectives and minimising the environmental impact of timber harvesting.

The achievement of excellence in the forestry sphere is not seriously provided for.

I consider that this need should be met by the compilation of a Statewide Manual of Instruction, covering all the various aspects of Forest Management.

I understand that such a manual was produced several years ago for use in the Gippsland Region. Furthermore I understand that the Ballarat Area Office has a copy and is engaged in preparing its own version for its own Area, using the Gippsland work as a model. If that is so, it is excellent news.

Ideally, the FMA Plan should lay down a set of performance standards which would ensure best forestry practice throughout the FMA. However, being realistic about space availability etc., I would suggest that the Plan should merely foreshadow the subsequent issue of a Manual of Instruction for Forestry Field Staff, and perhaps set out a list of the subjects to be given attention therein.

The following is a list (not intended to be exhaustive) of areas where I believe the discipline of a Manual would be extremely beneficial:-

. Development of an improved regeneration monitoring system, with appropriate (and mandatory) time constraints and numerical criteria. See my B) 3.

. Detailed procedures for re-treatment

. Monitoring outcomes of re-treatment

. Continued coupe monitoring, for survival, health and growth rate of regrowth, up to a designated cut-off point

. Field staff to be personally accountable for each facet of the regeneration process which is to be signed off in the records by the resonsible officer (as is now the case with harvesting of coupes

. Personal accountability of staff responsible for tree - marking (retained growing stock and habitat trees)

. Improved criteria for reservation of both retained growing stock and habitat trees (individual tree basis)

. Ensuring restoration of coupe after completion of logging

. Monitoring of major road system vis a vis storm damage and need for maintenance etc.

. Creation of a manageable and thoroughly useful format for forest records

. Maintenance of adequate compartment/coupe records, including:

- basic coupe data - gross & net area, site quality classification, W.U.P. yield predictions, actual recovered volumes, species composition, BA before and after SW1 harvesting

- details of retained growing stock - species, B.A. and comments on crown health and development,

- details of habitat trees,

- outcome of burning operation,

- full details of regeneration surveys, subsequent re-treatment and repeats thereof,

- long-term monitoring of regeneration and regrowth,

- spatial presentation of harvesting & silvicultural activities and fire occurrences, in map form,

- acknowledgement by relevant field staff of responsibility for the various field activities.

. Increasing the rigour of supervision of logging work on coupes, especially the measurement and grading of logs, and the degree of wastage in the form of "heading off" point, false cuts and long-butting See Endacott 1993 and later reference B)4.

(3) COMMENTS ON 1995 SHELTERWOOD REVIEW – IMPACT ON PLAN

References Kellas et al 1994, Endacott 1995.

This is a synopsis of my comments on this Review of July 1995.

a) Analysis of Regeneration Monitoring

. There has been a *de facto* lowering of the success/failure border-line, from 65% stocked quadrats to 50%. This change took place in East Gippsland in 1986 and later found its expression in Fagg et al 1994 and Kellas et al 1994. It was made for reasons of expediency and was never officially endorsed.

. If one recalculates the figures from Table 3 of the Review, using a 65% cut-off point instead of the 50% actually used, the % success drops dramatically from 90.1% to 63.3%.

. The whole basis of the regeneration sampling system is suspect, and the resulting figures are rubbery. There is no provision in the system for excluding coppice or undesirable lignotuberous shoots. No weight is given to species in quadrat tallies. The wide spacing of quadrat lines identifies only very large blanks.
The representation of a coupe by only a single percentage figure can project a wrong impression of the regeneration outcome for that coupe. A wide collation with a liberal sprinkling of erroneous coupe classifications will most likely give a misleading result.

. On the question of understocked coupes given re-treatment, the Review gives only a summation of the work carried out. No attempt is made to quantify the extent of deficient coupes which have remained untreated. Likewise, no audit is given on the effectiveness of the re-treatment where given.

b) The Review admits the likelihood that Shelterwood may be encouraging the species shift towards Peppermint.

c) It also admits that Shelterwood is probably seriously inhibiting and suppressing regeneration and regrowth. It recommends research in this area, but fails to draw on existing research results from East Gippsland, which substantiates the hypothesis and gives some figures. (The East Gippsland researchers have even invented their own jargon expression to describe the phenomenon - they call the pock-mark areas centred on overstory trees and devoid of regeneration "craters".) The Review did not undertake any field work to check out this problem.

d) The Review draws attention to a phenomenon which had already been noted by perceptive field staff, and reported on in East Gippsland - the attrition of overstory tree crowns after their sudden release by Shelterwood 1. The Review produces evidence that this is a common phenomenon in normal-sized coupes, but can be prevented by greatly reducing coupe size.

e) It reports some studies carried out at Bullarto and East Trentham, and a detailed CFI Plot analysis, to quantify the supposed surge of growth in retained trees following Shelterwood 1. (See Pages 15-21, Figures 3&4 and Table 5. See also my Section B)4, for discussion in the context of Sustainable Yield.)

f) It foreshadows the shortening of the period between Shelterwood 1&2, to meet certain contingencies. This makes a nonsense of half of the rationale of retaining an overstory.

Summing Up of Review

The non-conclusive Conclusion was greatly influenced by the desk study analysis of the regeneration monitoring figures from coupe records.

I have claimed that the very basis of the traditional monitoring procedure is defective, and its results must be used with great caution.

The Review was based on a minimum of field work. It fails to explore a number of aspects which, I feel sure, would have yielded results adverse to Shelterwood.

(4) SUSTAINABLE YIELD REVIEW – MIDLANDS 1995

Section 5.2 : Growth Following SW1, also
Section 10.3 : Impact of Management Strategies.

The Shelterwood System is claimed to benefit the total Sustainable Yield exercise in two ways:

(a) The total increment bonus attributable to Shelterwood (versus Clearfelling) comprises the estimated 13 m3/ha increment occurring over the 10 year SW1-SW2 period; this would not be available under a Clearfelling regime. Clearfelling would have removed the base 34 m3/ha volume at C/f harvesting time, thereafter concentrating wholly on getting an early complete crop of regeneration established. (This 13 m3/ha is estimated to include a ca. 3 m3/ha enhanced increment figure, by virtue of 10 years freedom from competition.)

These estimates seem to derive from CFI plot analysis (Pages 12-13 and Figure 5) which it is claimed reveals a 30% increment enhancement., plus modelling (Page 19).

It is claimed that Shelterwood achieves double utilization of the site during the SW1-SW2 period, i.e. retaining a a certain volume of fast-growing high quality mature growing stock which produces an attractively high increm,ent, while maintaining an adequate stocking of regeneration underneath.

(b) Apart from the alleged gain in absolute long term volume production, there is claimed to be a secondary benefit in manipulating the timing of the mature wood yield. The system maintains, on a continuing basis, a substantial volume of mature growing stock of good quality and current growth potential.

Computer simulations have identified a log supply problem period, which covers a couple of decades about the middle of the 21st century.

Anything which can spin out the currently existing mature forest resource, to provide additional log yield during that period of shortage, is considered to be of great benefit.

It is claimed that this technique - perpetually conserving 10 year's worth of SW2 volume - will materially help.

It is acknowledged that the retention of 7-9 m2/ha BA of mature trees will affect the understory of regeneration, but it is claimed that this can be tolerated, to serve the cause of medium-term sustainability. It is equivalent to taking some production potential away from the latter part of the 21st century and the 22nd century, and transferring it to the problem period in the middle part of the 21st century.

(There is a third advantage claimed by Shelterwood-protagonists, which lies more in the realm of economics and forest finance - that Shelterwood provides the seed free, while Clearfelling requires a significant financial input for artificial seeding).

Comments on above Scenario

(i) Can the great enhancement of post-SW1 growth be substantiated?

It appears that, in the context of past Shelterwood practices, an average increase of increment of 30% is very suspect

Kellas et al (1994) undertook a broadly similar analysis across a similar but smaller spread of CFI plots. The SY Review suggests (Page 13) that the Kellas work indicated a growth response of similar magnitude.

Kellas et al. gives a whole page of outline of their experimental and analytical methods, involving paired before-and-after values and the use of t-test etc. The SY Review uses only four lines on Page 12 to describe its methods, and leaves the reader confused as to how the analysis was conducted.

In fact, Kellas et al came up with a very subdued account of past growth enhancement after SW1; their findings seem to have been misrepresented by the SY Review. Here is the quotation from Kellas et al (1994)- Pages 20-21:

> *"Analysis of estimated girth increment of the retained trees on these CFI plots suggested that there was little or no change in increment for most diam. classes before and after harvesting, although there was a small but significant response when all data were pooled (Table 5).*
>
> *The trees retained following the initial shelterwood harvest have increased exposure to environmental factors which often result in reduction in crown area and a subsequent development of an epicormic crown and a potential risk of windthrow. This would result in a reduced rate of girth increment. Experience with other species at low stockings indicates exposure to wind has a marked adverse effect on tree form and growth. The dendrometer study, which showed a strong growth response, was conducted on small coupes surrounded by mature forest; exposure would have been much reduced compared to a large shelterwood compartment. The response takes no account of any losses from windthrow, Armillaria etc. which have been observed in some compartments (Kellas et al 1987)".*

There are two factors apparently not taken into account by the SY Review:

. Current actual log recoveries seem to fall consistently below the SW2 yield volumes/ha anticipated by the SY Review modelling (see next para.) This casts a cloud over the post-SW1 increment estimates.

. For several years there has been a policy in place to abandon the practice of retaining well-crowned Class 1 trees, because of high incidence of windfall loss. This practice must automatically reduce the growth possibility of the overstory.

(2) Can the SW2 Yield Forecast be Substantiated?

The SY Review modelling sets the average figure for SW2 yield at 47 m3/ha, based on a retention rate of 7-10 m2/ha BA, and a SW1-SW2 time lapse of 10 yrs.
Field records of recent SW2 harvested volumes give a range of 19 - 47 and means in the range of 30-34 m3/ha D+. Note that these are older coupes, where the SW1 retention rates were >10 m2/ha and SW1-SW2 time lapse of 15 years or more.

Factors which undoubtedly impact these performance figures are:

. Quality of trees chosen as residuals. There is the small crown factor mentioned above, but even apart from this, it is difficult to find reasons for the retention of some trees - apparently chosen merely to make up the desired basal area.

. Crown exposure. Emphasized by Kellas et al, as a phenomenon common on large coupes. It is noted that the Plan intends that maximum coupe area should be set at 40 ha.
. Logging damage
. Damage to bole and crown from regeneration burn.
. Mortality and windfall.

(3) What is the Full Extent of a) complete suppression b) inhibition of regeneration by the Overstory, during the SW1-SW2 period?

There seems to be little authoritative data from the Midlands, although abundant information from East Gippsland, indicating the serious and widespread inhibiting influence of overstory trees.

This is one of the several factors used in the Review's SY computations about which we have been given no information.

(4) What confidence can be placed on the the figure of >90% success rate for Shelterwood regeneration?

In my previous Section (3) (Page 18) I have sought to cast doubt on the origins of this figure.

What would be the SY impact if it could be shown that the above figure should be 20-25% lower? This factor is not included in the Sensitivity Analysis in Table 4.

(*Reprise*)

ENDORSEMENT OF SHELTERWOOD SYSTEM BY FMA PLAN

Under Section 4.2, Pages 33-35, the FMA Plan fails to seriously discuss the pros and cons of Shelterwood versus Clearfelling.

At the bottom of Page 33 it gives as the two major benefits of Shelterwood :

" . it provides an abundant source of seed for regeneration,

. it provides for regeneration of the whole coupe while allowing for continual rapid growth of the highest quality trees on the coupe, which in turn contributes to a higher sustainable yield than would be possible under clearfelling."

The treatment by the Plan of this area of debate is perfunctory and shallow. It does not mention anything of the downside attached to shelterwood, nor of the positive aspects of Clearfelling.

On the other hand, it fails to discuss what I would regard as the most compelling argument for Shelterwood - the manipulation of mature wood harvesting to ameliorate the forecast log shortage problem of 50-60 years hence.

Here is a summarised statement of 12 negative aspects which are part of Shelterwood:

. Inhibition and suppression of regeneration over 10 years.

. Selective inhibition of Messmate seedlings, and encouragement of Peppermint lignotubers and coppice shoots.

. Considerable uncertainty and variability in regeneration results. I do not believe that the >90 % success rate reported by Kellas et al (1994) would stand up to close critical examination.

. Delay and high cost in patching up by re-treatment.

. Possible misadventure befalling retained trees - exposure factor, windfall, mortalities, crown or butt scorch, defects arising from logging damage.

. Perceived need to minimise crown scorch by delaying regeneration burns by 1-2 years.

. Perceived need to minimise windfall by deliberately choosing only small-crowned Class 1 trees for retention, thereby reducing CAI possibility of the overstory.

. Two logging operations instead of one - unnecessary extra soil disturbance, with catchment implications.

. Possibility of SW2 inflicting damage on regrowth.

. Inability to carry out restoration work on landings until completion of SW2.

. Hypothesis that there may be a small Armillaria effect in prolonging harvesting activities for 10 years.

. Administrative and operational complexity, ill-suited to a Department with a grossly inadequate field establishment, accompanied by a run-down of skills.

If Shelterwood were to be the staple silvicultural system in the future, (and as I see it, the only justification would be the perceived need for manipulation of mature forest yield, to address the forecast sustainability problem 50-60 years hence, and provided that the input data to the modelling process can be thoroughly validated), then some provisos should be part of the package :

a) Regeneration enhancement programme, to be implemented immediately after the completion of SW2. The objective would be to partially make good the damage inflicted on the regeneration by the suppression from overstory over 10 years, and logging damage. It would comprise the sparse replanting of the blanks with vigorous well-developed Messmate seedlings.

b) A general upgrading of the whole Shelterwood process, involving:

. better choice of SW1 retained trees,
. smaller coupes,
. flattening heads instead of delaying burning,
. better total regeneration monitoring system,
. prompt re-treatment,
. better compartment records,
. more field staff, with necessary skills, guided by Manual of field instructions.

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