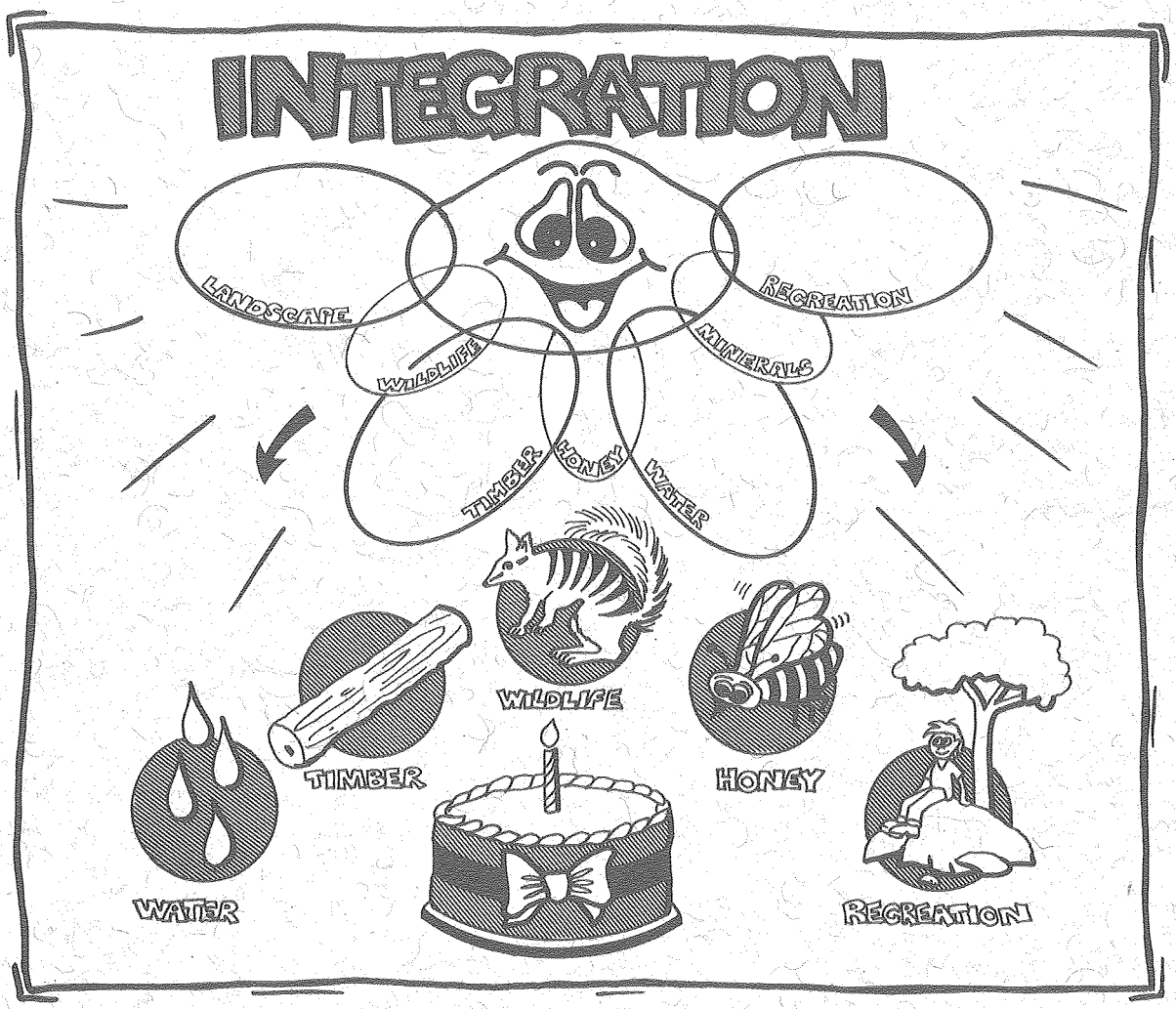

INTEGRATION:
THE KEY TO THE FUTURE OF THE HARDWOOD FOREST INDUSTRIES

A Paper Presented to
THE FOREST INDUSTRIES MACHINERY EXPOSITION
Myrtleford, Victoria
April 4-9, 1992

By
S R SHEA
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ACKNOWLEDGEMENTS

The concept of integration and its application that have been put forward in this paper have been rigorously set out in the 1987 WA Timber Strategy and more recently in *"A Review of Management Strategies for the South-West Forests of Western Australia"*. Both the documents and the ideas, research and practical trials on which they are based, were the product of the efforts of a large number of people who work in CALM.

A. INTRODUCTION

When I accepted this invitation to speak at this conference I was given a specific brief -

"To provide to you the latest information on the offtake and size of hardwood logs on a regional basis throughout Australia over the next decade or more."

I am sure you would find a half hour exposition on this specific subject less than exciting. I have provided the latest information on hardwood log quantity and quality in an appendix to this paper. In summary - I believe there will be lots of logs, but they will be smaller than you've been getting in the past.

The questions about the future of the hardwood industry don't relate much to the biological factors affecting logg offtake, but to whether the forest industries will have access to native hardwood forests and whether the products of the logs can be sold at a profit. Consequently, I would like to focus this paper on the political, management and commercial problems that you will need to overcome if you are to capitalise on the hardwood log resource, and suggest some approaches to dealing with them.

These issues are complex and difficult. There is no single or easy tactic, but I believe there is a strategy which will deliver - integration.

B. THE END GAME

I believe there is less than a year to resolve the political problems that have bedevilled the industry over the last decade, and probably less than three years to deal with the industry's medium and long term economic problems.

Since the early 1970s we have had more than twenty inquiries initiated (Table 1) which have been directed at either forest management or at the forest industries. It could be argued that a positive outcome of those inquiries has been that there has been a considerable amount of largesse bestowed on their victims. But the fact that there has been a succession of them suggests that they have not addressed the underlying problems. It has been difficult to derive anything positive from many of these inquiries (except another inquiry), because dealing with many of them, in the words of one politician is "like wrestling with a column of smoke".

Not surprisingly, when the Federal Minister for Resources, Alan Griffiths, proposed to the Standing Committee on Forestry that the States should cooperate with the Commonwealth and develop a National Forest Strategy, initially there was a lack of enthusiasm. But a cogent argument was put that a nationally agreed National Forest Policy could draw together all of these inquiries into an "end game". The prospect of bringing to a close the "Orwelian" phase of forest policy formulation (Figure 1) in Australia and its replacement with a stable political environment was very attractive. Consequently the States have given their strong support to the Federal Minister's proposal. The "end-game" has commenced (Figure 2). Rational forest management must win or the forest industries are dead.

But there is also little time to address the economic and commercial problems that confront the industry. The political problems and economic problems are not unrelated. Over the past several years I have sought answers from overseas investors as to why investment in hardwood plantation forestry has been directed in massive amounts to countries like Uraguay and Chile. The answer was that Chile is regarded as a more politically stable country than Australia. We will not obtain the investment in the forest industries from either overseas or within Australia unless we have political and legal security for those investments.

Figure 1. **Hopefully the "Orwelian" phase of forest policy formulation is drawing to an end**

Figure 2. We have commenced the "end game"

Table 1: A sample of inquiries pertaining to forestry in Australia

Commonwealth initiated

Resource Assessment Commission - Forest and Timber Inquiry

Ecologically Sustainable Development Working Group - Forest Use

National Plantations Advisory Committee

South East Forests Regional Consultative Committee (Commonwealth / State (NSW and Vic) / Local Government / Industry / Unions Committee)

South East Forests. Joint Scientific Committee. 1989/90

Wet Tropics World Heritage Nomination

Industry Commission. Enquiry into Paper Recycling. 1990

Industry Commission. Raw Material Pricing for Domestic Use. 1991

Report of the Senate Standing Committee on Trade and Commerce "Australia's Forestry and Forest Products Industries". 1981

Report of the Senate Standing Committee on Science and the Environment, "Woodchips and the Environment" 1974-1977

1977 Senate Standing Committee on Science and the Environment. Integrated Harvesting in SE Forests.

1974 Committee of Inquiry into the National Estate (Senate?)

1972 Select Committee House of Reps. Inquiry into SE Forests Integrated Harvesting.

1967 Senate Inquiry into Wood Chipping

State initiated

Fitzgerald Inquiry into the Great Sandy Region (Fraser Island)

East Gippsland Forest Agreement Study - Analysis of whether feasible and prudent alternatives exist to the logging of National Estate forests in East Gippsland (September 1990).

Report on allegations of illegal logging and the accountability procedures of the Department of Conservation and Land Management in relation to logging in south-west forests, by Daryl R Williams AM QC.

Victorian Plantation Impact Study 1990. Reviewed the State's plantation program for softwood and hardwood in the light of public submissions and hearings.

Board of Inquiry into the Timber Industry in Victoria. The Board, comprising Professor Ian Ferguson, conducted a formal public inquiry in 1984 and 1985.

Victorian Timber Industry Strategy 1986. The strategy built on the report of the Board of Inquiry but also involved extensive further public consultation.

Helsham Inquiry in Tasmania, 8 May 1987-8 May 1988.

Since 1970 some 30 Land Conservation Council studies into regional land use have been undertaken. (For all intents and purposes, each of these studies is a regional inquiry about forestry).

But even if we solve those political problems, we must also recognise that now wood is an internationally traded commodity and there is no market that is protected by distance. Last year I attended the World Conference on Forestry in Paris and found that there was an international consensus that there would be an increasing world demand for wood fibre in all its forms over the next several decades. As a consequence of this increase in demand, there will be significant opportunities for forest based industries. But there was also a very strong consensus at that conference that there would be no wood famine because the market would rapidly address any mismatch of demand and supply.

Australia has the opportunity to capitalise on the increasing demand for wood fibre if it can compete in the world market. The signs so far are not good. Currently Portugal, Chile, Brazil and Uraguay are filling the demand for hardwood fibre. In Alberta there have been five new pulp mills constructed over the past several years. On the horizon we have the prospect of complete economic union of the EEC which might decide that foresters, rather than farmers, are more appropriate to maintain their countryside. If they get the politics right, there is the potential for a huge resource of wood, in what used to be called the USSR, coming on stream.

It is not necessary to cite examples from far off countries, which may be rebutted by phony excuses that these countries have abysmal working conditions. New Zealand's forest industries are undergoing massive revitalisation. They are achieving significant overseas investment in both plantations and value adding forest industries. This year alone they will plant 37,000 ha and their Minister has indicated the target is 100,000 ha per year. New Zealand pine landed in Sydney and road transported to Brisbane is competing with the locally produced product.

I hope I've convinced you, if you needed convincing, that time is running out. In the rest of this paper I propose to suggest some ways by which we can ensure that the "end game" results in a score not a bomb.

C. INTEGRATING PHILOSOPHIES

I have no expertise in economic policy formulation, but I, like many other observers, have come to the conclusion that economic philosophy, like many other philosophies, is subject to major swings depending on what is the current fad. Quite clearly we are now on the "free market", "level playing field" side of the arc, and a decade or so ago we were in the public intervention regulation phase. I believe there is considerable justification for the removal of the stultification of innovations by bureaucracy and the exposure of our economy to the stimulation of competition. But Forestry could be particularly disadvantaged, because of some of its unique characteristics, if our quest for "market purity" becomes an obsession.

The majority of our hardwood resource is derived from publicly owned forest which must be managed on behalf of all the community for a multiplicity of values and uses. Public management of native forests on behalf of the community for all forest uses is a prerequisite to its utilisation as a source of hardwood timber. The long time-frames involved in forestry and forest industry planning also need to be taken into account by those advocates of a pure market approach. Forest industries, if they are to be successful, must have scale. The imposition of a market philosophy, which imposes the break up of the industry into uneconomic units, is a stance of an economic irrationalist.

Consequently, although it goes against the trend, I believe it is essential when we bring about changes in forest management and the forest industries that we incorporate the best elements of the market and the public intervention philosophies. I

believe it is not beyond our wit to pick the best elements of each philosophy, which is applicable to forest management and the industry, and use them. We must reject the ideology that proclaims that cooperation and the free market are mutually exclusive concepts.

D. INTEGRATION OF FOREST MANAGEMENT AND USE

A potted history of native forest use by Europeans

Apart from a short period when forests provided the commercial lifeblood for the first settlers, the early decades following European settlement were dominated by uncontrolled overcutting and a fight between foresters and farmers. It's ironic, given the claims by some critics today that foresters are opposed to conservation of our forests, that at least one of my predecessors in Western Australia was despatched because of his attempts to preserve the forests from clearing for agriculture and overuse by large timber companies. By the 1920s most States had established a legislative and management basis which secured the forests from destruction by overuse or clearing.

In the following several decades, timber use of native forest was dominant. There was recognition of other important values like water, particularly in Western Australia, but the forests were so large relative to population, and the demand for timber so great particularly after the Second World War, that there were few conflicts. That is not to say that timber production was rampant and destructive. In the period between the two World Wars, there was a tremendous application of forest expertise, and the progressive implementation of sustained yield concepts and the application of techniques to ensure regeneration of forest and the management of fire.

In the 1950s there was a progressive increase in community use of the forest for a variety of purposes in addition to timber production. While some forest agencies were slow to respond to these demands, which in some situations were resisted by large timber interests, by the 1960s if it was not formal, there was recognition of the need to manage native forests for multiple uses. By the end of the 1970s all State agencies had formally introduced multiple use.

But as the demand and interest in forests increased through the 1970s, parallelling the increasing awareness of the community of environmental issues, the forest managers and their political masters responded by converting the concept of multiple use to multiple compartmentalisation of the forest (Figure 3).

Initially this response resolved some of the conflicts. Compartmentalisation will work while the forests remain relatively large relative to the demands that were being made on them. But inevitably the demands and the conflict have become so great that there is no longer room to manoeuvre because there is a finite area of native forests.

Compartmentalisation has two intrinsic characteristics which will ensure it ultimately fails. Firstly, compartments create fences which only delay conflict temporarily. Fences inevitably promote conflict because they become battlelines between conflicting user groups. Secondly compartments inevitably mean single or fewer uses excluding the potential for increasing the "size of the cake" by exploiting synergisms (Figure 4).

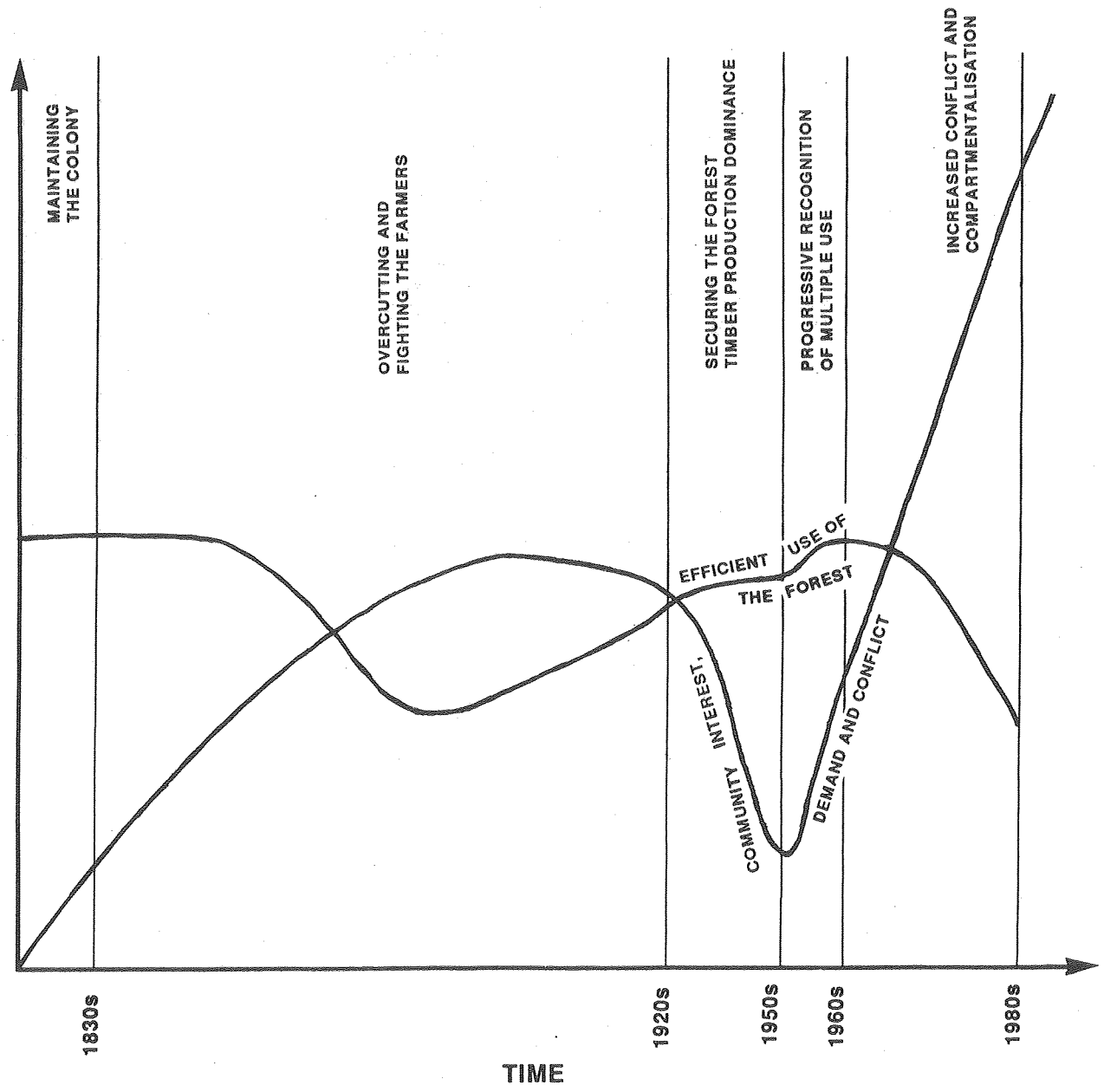


Figure 3. Changes in forest use and community interest over time

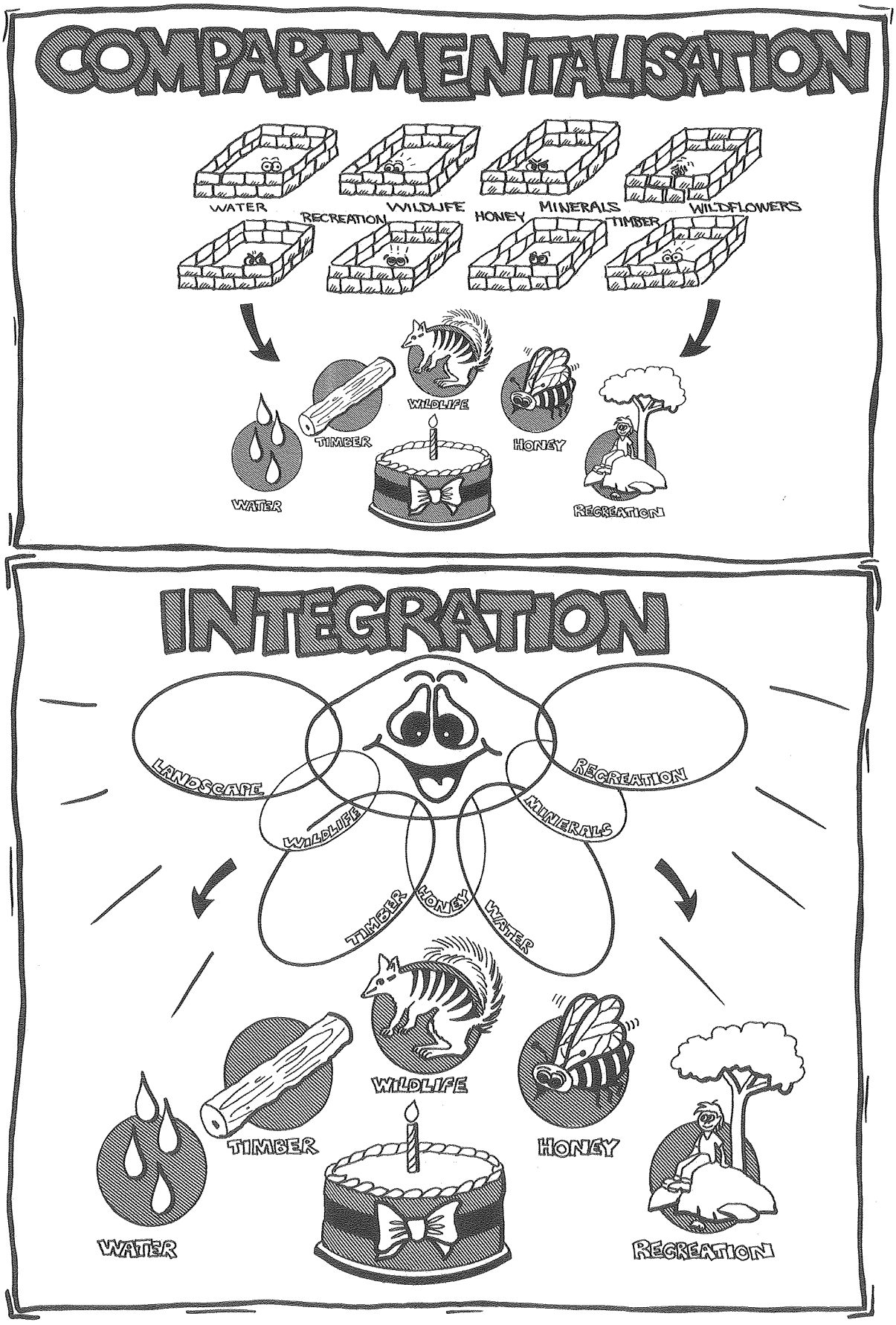


Figure 4. **We can make "the cake" bigger and reduce boundary disputes by integration**

I hope that the forest industries have recognised the dangers of subscribing to the philosophy of compartmentalising the forests. I fear however, that there are still people both within academia and the industry who see the future of timber production in the native forests in discreet, highly productive areas, protected by stockades. I think that history shows that the next step after the compartment in the corner of the native forest is the total exclusion of the forest industries from native forests in Australia.

I believe the most important factor, which is going to determine the quantity of hardwood logs available to the forest industries from native forests in the future, is the ability of the forest managers working with all users of the forest to ensure that the forests are firstly preserved and that all users of the forest are catered for. This will only be achieved if we develop a system of
management which is totally integrated.

Integrated forest management and use is caring for, and sharing, our native forests. Unless we believe this is the right way to go, achieve it in the forest and convince the community that is what is being done, the future offtake of hardwood logs from native forests may be zero.

The elements of integrated forest management

1. Integrated forest management recognises that forests are a dynamic interconnected system (that is, one that varies in time and space).

2. Forest management must ensure that all forest processes and uses are sustained. The concept of sustained yield is not a new one. It originated in medieval times in the forests of Europe many hundreds of years ago. Initially, and ironically, it flowed from a concern of the Lords of the Manor to preserve

the habitat of the forest to ensure that venison was supplied on a sustained basis to their castles. The original foresters were wildlife managers, but in the last hundred or more years it became more narrowly restricted to the concept of sustained timber production. In Australia over the past several decades sustained yield of timber became a basic tenet of foresters and it was assumed that in the process of ensuring sustainability of timber all other values would be sustained.

The concept of integrated forest management explicitly recognises that the most important values to sustain in our native forests are the processes, that is, water, nutrient and carbon flows, soil systems etc, which drive the dynamic forest systems. It follows that any use of the forest cannot be permitted if these processes are impaired and that from a social and ethical perspective, any specific use itself must be sustainable.

3. If we are to sustain the forests all uses must be integrated with the natural forest cycle. This means that we must sustain the structure of the forest in addition to the processes and uses. Forest management strategies that result in forests consisting entirely of either mature trees or immature trees would not satisfy (1) above because each stage of development (or structural element) of a forest is a particular expression of ecological processes and a particular suite of plant and animal species associated with it. Because forests are dynamic, that is individual trees and stands regenerate, develop, decline and die, at any point in time, there must be approximately equal areas of each stage of development or age class if the final stage of development ("old growth") is to be sustained.

4. The level of a particular use from the forest is primarily determined by the principles set out above, that is the forest determines the level of use, because

the level of use cannot exceed the levels that would adversely affect forest processes. Integrated forest management will deliver a mix of uses and no single use will be maximised. But the collective value of all uses will be much greater than if a single use philosophy is applied.

5. Integrated forest use increases the potential to develop synergisms between different uses. For example, increased water production and timber production can be achieved by thinning. Where uses are in conflict, integrated forest management exploits the potential to vary use in time and space to avoid conflict.

Prerequisites to successful integrated forest management and use

1. An adequate knowledge of forest ecosystem processes is required for the successful production of integrated forest management. While our knowledge of forest processes can always be improved, the fact that we have sustained our forests despite significant use over a period of decades indicates that they are resilient and that the knowledge base that has been used to manage them is adequate.

2. Marketing the concept of integrated forest use is vital. If integrated forest use means that users must share the forest, sharing by definition means that no single use will be maximised. Consequently, it is possible to argue that if one is cynical, that the concept of integrated forest management has a fundamental political flaw. That is, its application will ensure that all users (or constituents) will be perpetually dissatisfied because they can't maximise their own particular use of the forest. While recognising that "the horse called self interest is a powerful animal", I believe that if we had some leadership in our community we could at least partially nobble it (Figure 5).

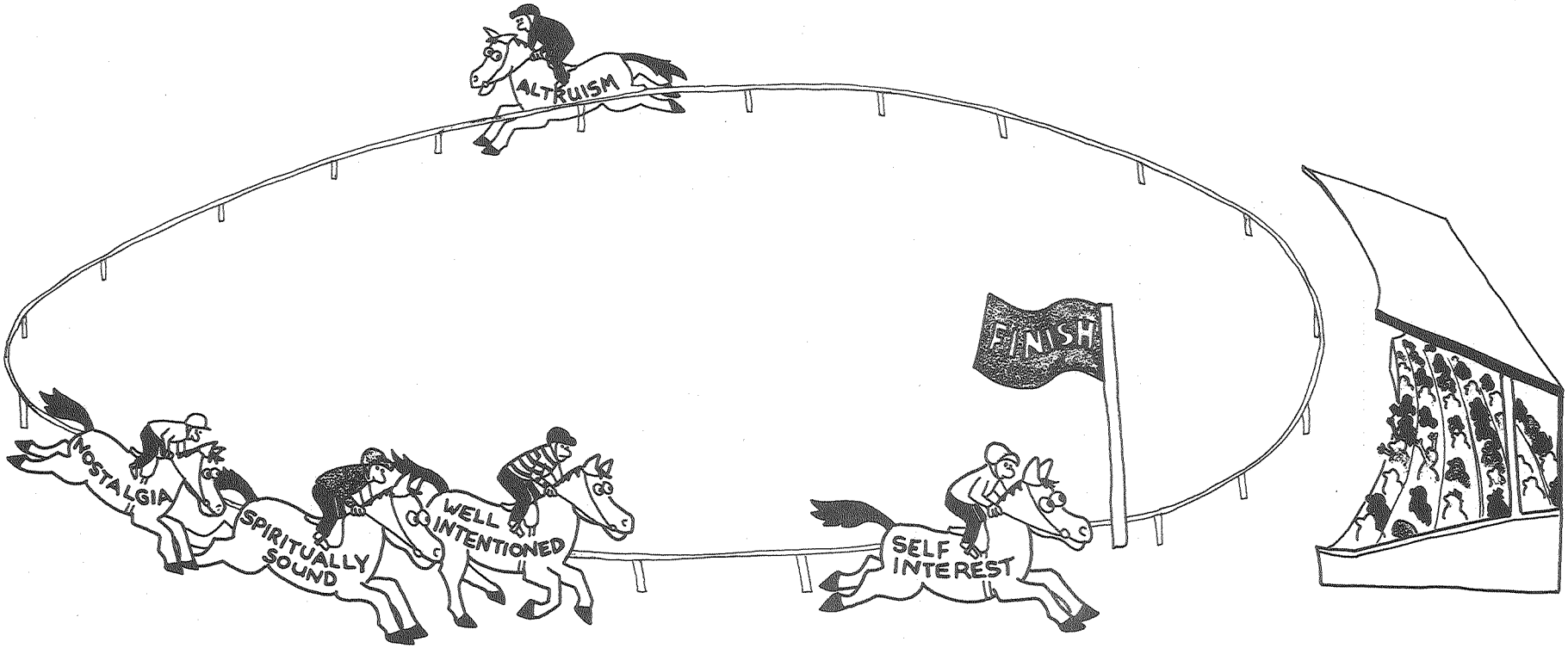


Figure 5. It may be necessary to partially nobble the leading horse by effective marketing and leadership if integrated forest management is to be accepted by the community

We must also ensure that we market effectively the knowledge we have of our forests. For example, while it is true that Australia has an abysmal record in terms of both animal and plant species extinction, how many people in the community know that there is not one single animal or plant species threatened by forest management practices in any Australian native forest today? How many people in the community recognise that in this age of concern about biodiversity that the greatest threat to the biodiversity of animals is not the chain saw but the fox? We have succeeded in quadrupling the numbers of some endangered animal species in Western Australia simply by eradicating the fox.

In a separate paper to this conference, I have discussed in more detail the importance of marketing (Shea 1992).

3. If completely integrated management of forests is to become a reality, we must maximise the use of an application of the technology that is available to us. When I first joined the honourable profession of foresters, I was proud to be told that it was the second oldest profession. It is true to say that some members of the community subsequently have suggested that some members of my profession enjoy dual membership with the world's oldest profession. While I defend the integrity of foresters, I do believe that we are sometimes constrained by our medieval history. We have not recognised and employed some of the miraculous technology that has only recently become available to us. I remember, when I commenced work as a student in the forest, spending weeks helping the district forester locate the boundary of a particular site in the forest with a compass and chain. Today's foresters can call up a satellite and locate their position within two metres within two seconds. We have now access to sophisticated systems of measuring our forests, modelling our forests

and, in particular through the wonders of geographical information systems, considering dozens of forest management options in a period of hours, whereas our predecessors would have taken decades. Some of our most politically damaging activities - those that make the forest look ugly - I believe can be significantly overcome by combining this technology with the principles of visual resource management.

It is not just a requirement to obtain the technology. We have to throw off the shackles on our ideas and visions imposed by the realities of practising forestry with primitive tools. We are in a similar position to that politicians found themselves when television was first introduced. It took some time for politicians to accept Marshall McLuhan's edict that "The media was the message" and that they had to change not only their tactics but their strategies.

Integrating administrative and management systems

Integrated forest management will require hard work and immense skills. We therefore cannot carry the burdens of unnecessary institutional and administrative constraints.

It will be of no surprise to you that I strongly advocate that government bodies associated with the management of public land should be integrated. Apart from the removal of territorial disputes between public servants, which inevitably spilt over into politics, an integrated agency has the capacity to deliver skills and resources at a much higher level with the same dollar input than single use agencies.

The scientific rationale behind the formation of CALM in Western Australia was simply that the same skills, administrative arrangements and logistical support are required for managing the desert, the forest, or a national park or an area where

timber is produced. This must be so because the fundamental processes driving these different ecosystems or affecting these different uses are the same.

I acknowledge that it is not possible to have all government agencies in one department and that there are obvious constitutional barriers to the amalgamation of Federal and State agencies. But I believe it is the responsibility of public servants to derive mechanisms to ensure that this institutional compartmentalisation does not provide a barrier to achieving a better deal for our forests and the people using them.

It is possible even when different organisations have different charters and different political masters to integrate management. There may be people at this conference who are sceptical of the agreement between the Australian Heritage Commission and CALM. I don't share your scepticism. I am confident that what has been achieved will be sustainable. But even if it failed tomorrow, the benefits we have already derived from the combination of the skills of the two agencies would justify the resources that had been expended to achieve it.

But the need to integrate the activities of different public institutions is not enough. The forest industries, particularly through their logging companies, can play a major role in the successful implementation of integrated forest management. In Western Australia in the 1987 Timber Strategy, we foreshadowed the introduction of integrated logging in our native forests. We believed that a system which, at its extreme, involved five different companies visiting the same coupe one after the other to harvest logs for five different sawmills was absurd. Integrated logging has now been introduced and we have "one stop" logging. We are now implementing the next phase. We believed it was also absurd to have, after the five visits of five logging companies, a truck arriving from CALM to carry our silviculture. We see no reason why the logging industry can't also be involved in ensuring that all forest values are sustained and that other uses are improved.

For example, reduction of the *Banksia grandis* understorey in the jarrah forest is probably one of the most important ways by which we can protect the forests from jarrah dieback, because this species is highly susceptible to *Phytophthora cinnamomi*. It costs between $100 and $200 to reduce banksia density when it is carried out as a separate operation. When the operation is carried out as part of a logging operation, the cost is reduced by up to 90 per cent.

It might even be possible in the future to use logging operations to deal with the greatest threat to native animal biodiversity in our forests - the introduced fox (Figure 6).

Apart from the benefits deriving from greater efficiencies, we are already seeing the psychological benefits of workers in the industry having ownership of the whole forest rather than just the logs. We have introduced systems where the logging personnel are, with appropriate supervision, marking trees for thinning operations and in some areas managing the whole coupe - "contractor coupe management". A few weeks ago, one of our forest officers was taken to task by a logging contractor because he had not marked a tree for habitat retention which had a bird's nest in it!

The concept and the responsibility for integration does not stop with the management by either public or private organisations involved in forest management. The Unions who represent forest workers have a major role to play in ensuring that demarcation disputes do not threaten the potential for integrated forest management.

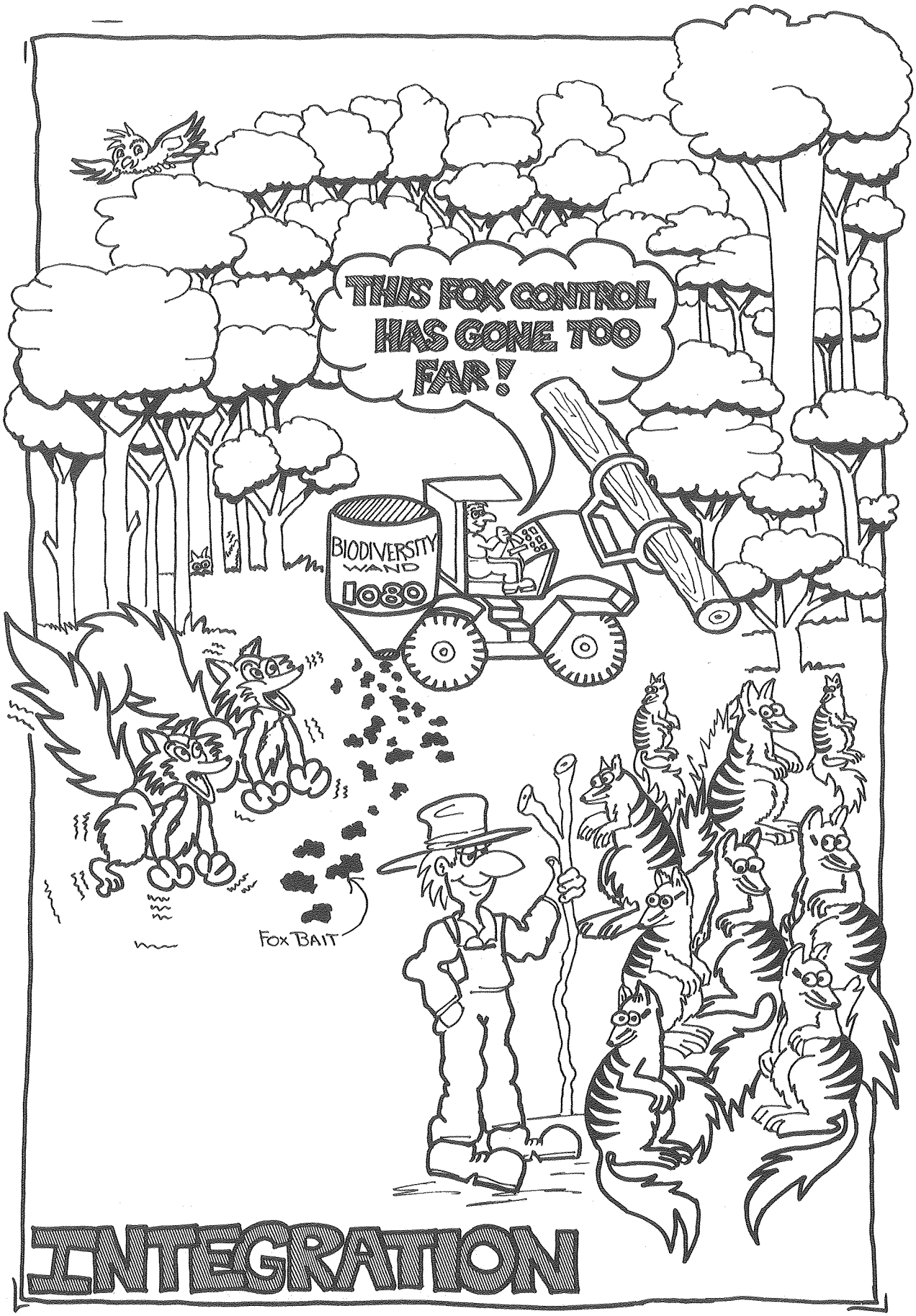


Figure 6. **Using the logging industry to promote biodiversity**

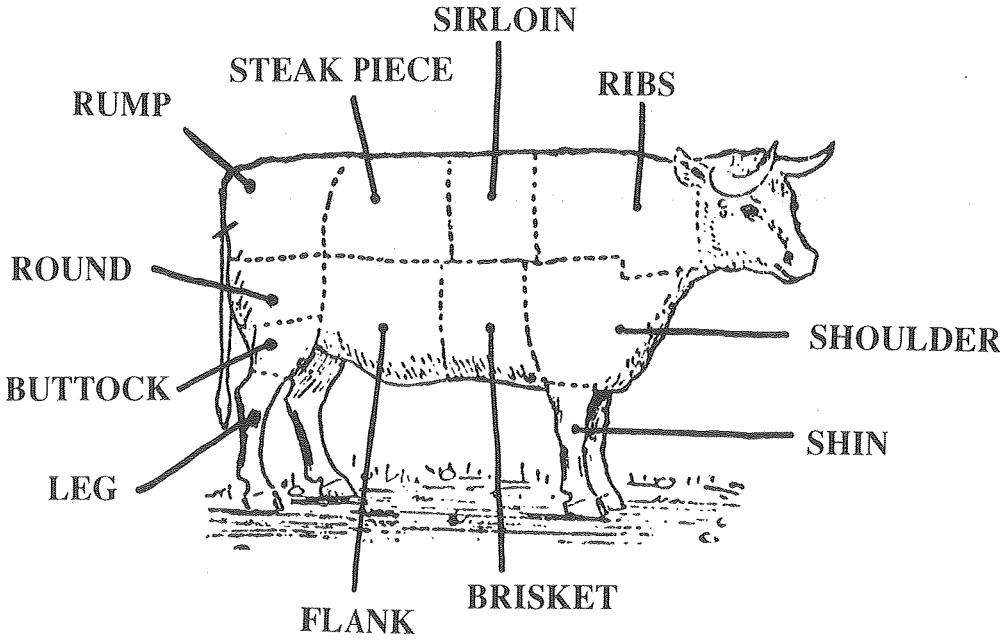
E. INTEGRATED UTILISATION AND MARKETING

Integrated utilisation

While it's fashionable in some political circles and some community groups to denigrate the importance of utilisation of forest residues, it is obvious that the hardwood industry will not survive if it cannot utilise an increasing proportion of the bole of the tree that is felled and the log that is delivered to the sawmill. As I have previously observed (Shea 1991), just as no butcher would survive if he only used that part of the steer which produced fillet steak, so the forest industries will become bankrupt if the irrational objections to forest residue result in legislative constraints (Figure 7).

This does not mean that the forest industries should not vigorously pursue value adding. It is essential that a much larger proportion of the log that is delivered to the mill is utilised for higher valued products than is the case currently. Obviously the nation benefits, provided that it can be done profitably, if our hardwood resource can generate more value. But the financial viability of individual mills may well rest on the ability to derive greater value added products from hardwood logs. For example, increasing the proportion of value added products from hardwood logs, and selling them into an international market, is one of the ways by which the hardwood industry can buffer itself from the massive fluctuation in the domestic green sawn structural market. No industry can invest and capitalise on the new technology becoming available if it is subject to massive four year fluctuations in demand.

Increasing value adding also has important political advantages. A forest industry which has a significant proportion of produce which earns more per unit of production on the overseas market, employs more people and has products that are visually pleasing, like high grade furniture, is much more marketable than one that has not.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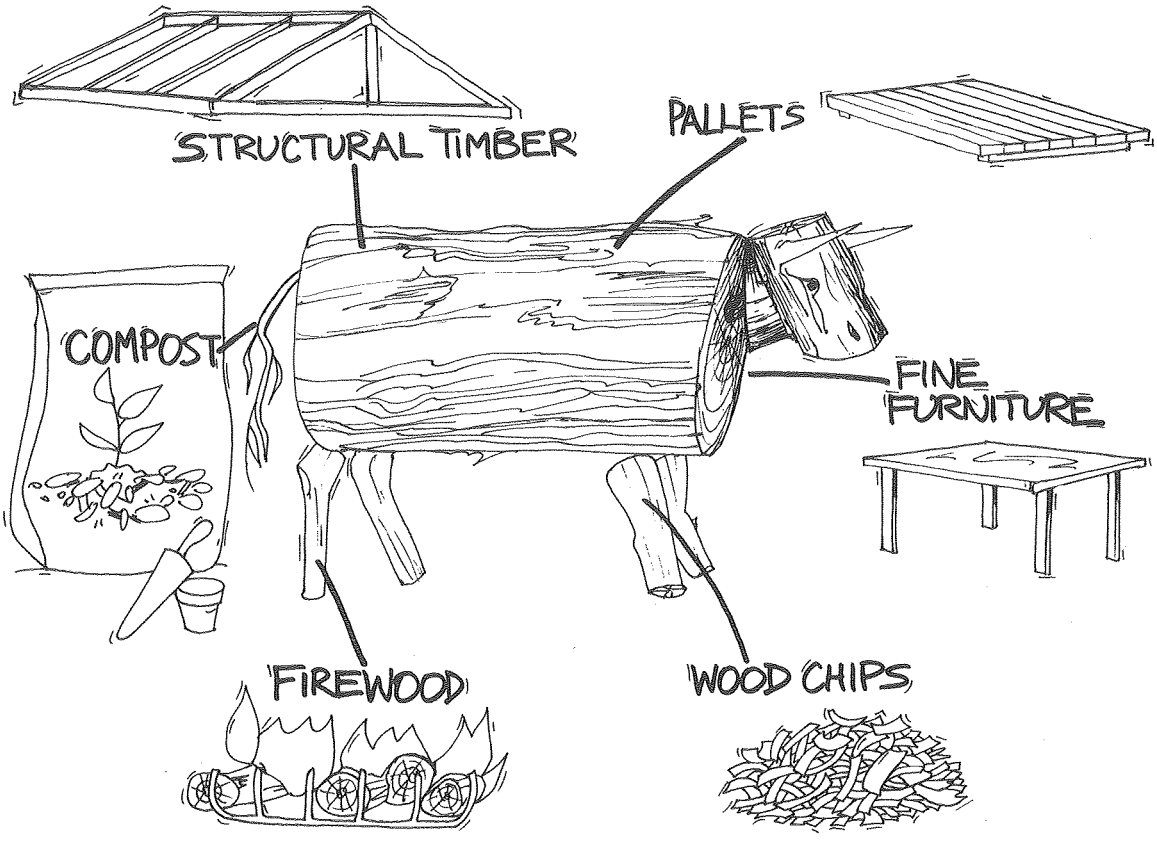

STRUCTURAL TIMBER
PALLETS
COMPOST
FINE FURNITURE
FIREWOOD
WOOD CHIPS

Figure 7

Estimates of the proportion of hardwood logs currently used for value added products and the potential to increase value added production are shown in Table 2.

Table 2: Proportion of hardwood sawlogs suitable for processing into high value products

	VICTORIA	NSW	TASMANIA	QUEENSLAND	WESTERN AUSTRALIA
Approximate **current** proportion of sawlog processed into high value products	25%	<25%	70%	NEA*	25%
Approximate **potential** proportion of sawlog suitable for processing into high value products	60%	>30%	70%	30% of SE Queensland Region	60%

NEA* - No estimates available

Integration with the market

Success in integration of forest management and utilisation, will be hollow achievements if there are no markets in which to sell hardwood products profitably.

There are in Australia, laws to prevent market manipulation. But this does not mean that we should not be aware of overall market trends and develop strategies to cope with them.

Over the next two decades, there will be a progressive increase in the quantity of softwood timber entering the Australian market. The hardwood industry will be partly displaced from the traditional green sawn structural market. But it is possible to avoid bloody conflict on the domestic market. Australian hardwoods have a comparative advantage on the world market as value added products. It is essential that the investment in technology and marketing in the hardwood industry, which will make possible the production of profitable value added products, coincides with the increase in the softwood log resource.

Marketing value added hardwood products overseas will be time consuming and expensive. It must therefore be integrated. While it's logical that there are laws preventing collusion on the domestic market, I cannot see why we continue to adopt an uncoordinated approach to the international marketing of our products. Our competitors in the international market invariably approach marketing in a coordinated way, while individual companies in the forest products industry continue to adopt a "lone scout" strategy.

F. THE POTENTIAL FOR INCREASING THE HARDWOOD RESOURCE

If we succeed in winning the commercial and political battles, there will be a significant and sustainable resource of hardwood logs from native forests. But I don't believe we should stop there. There is also an excellent opportunity to build on that platform and expand the hardwood industry from plantation grown hardwoods.

The potential to integrate the existing hardwood industry with the new one

Some members of the community have advocated the replacement of the existing hardwood resource based on public native forests with plantations. This ignores the difficulties of establishing a "greenfields" industry and the potential to use the existing hardwood industry as a stimulus to the establishment of an expanded industry based on hardwood plantations.

Much of the research which is currently being undertaken on hardwood plantations is only possible because we have the existing hardwood industry.

There are also excellent opportunities to assist the stimulation of the new hardwood industry by "piggybacking" on existing equipment and infrastructure. For example, we have already successfully trialed logging equipment, which is being used to undertake thinning in the karri forest to harvest *Eucalyptus globulus* plantations in Western Australia. In Western Australia currently there is a major constraint on the profitability of the hardwood logging industry imposed by restrictions on logging during wet weather conditions. The unit cost of logging hardwood plantations could be substantially reduced if part or all of the existing logging infrastructure used to harvest the public native forests during dry weather conditions could be utilised during the winter months when currently they are idle.

Integrating trees into farms.

In Western Australia already and in the future across Australia, the only land base available for hardwood plantations will be on already cleared land being utilised for agriculture production.

This land will not become available in any significant quantities if we only use whole farm purchase, or large block plantings on farms, to achieve the land base which is needed.

"Arguments that trees can generate more economic activity than traditional agricultural crops may be true, but are irrelevant. Shire councils have constituents who are concerned about whether the school bus will continue to service their farms, or whether the local school will be maintained if large forestry companies or State agencies buy whole farms for tree planting and manage them from regional centres." (Shea 1990).

But apart from political constraints which will prevent wholesale planting of agricultural land, there are commercial restrictions. There will always be very significant areas of a farm in which agricultural production will return a higher value than tree production. This means that if we purchase the whole farm we will have to pay more than is justified for a timber production activity.

I suspect, in part, that some people who have a pessimistic view of integrating trees into farms have not caught up with the technology that is evolving which is increasingly making it possible to establish highly commercial timber production plantations on 20 per cent of a farm without loss of agriculture production.

For example, in Western Australia we can accurately predict tree growth on virtually every site type throughout the high rainfall zone (less than 600mm) in Western Australia. Our colleagues in agriculture are developing techniques which, at a cost of less than $4.00 per hectare, can assess soil, salt and geological formations 30 metres below the surface of the land from the air.

The development of new logging and harvesting technology, mobile chippers and improvements in road and rail transport systems, are rapidly decreasing the economic constraints on smaller and more dispersed commercial plantations.

The integration of trees into farms in Western Australia and many other parts of Australia will not only accrue significant commercial benefit to the farmer, the community and the nation, but offers the prospect of solution of many of our environmental problems, such as salination, eutrophication and soil erosion, without a cost to the farmer or to the community.

Integrating the products from hardwood plantations into the market

Unfortunately this new resource could easily be torpedoed if we ignore the need to integrate with the market place. For example, in our pursuit of value added industries, and in particular pulp mills, we must not impose political and commercial constraints which will prevent us capturing investment from overseas companies who are interested in securing a secure wood fibre resource for the established overseas integrated pulp and paper industry.

Some members of the community have concluded that the growing of hardwood plantations for hardwood fibre export will inhibit the construction of Australian pulp mills. But the established overseas integrated pulp and paper industry will obtain their wood fibre from other countries if we don't supply it. The injection of funds by overseas pulp and paper companies to establish hardwood plantations for their fibre requirements will help us establish a pulp mill in Western Australia. There is no shortage of land in Western Australia for hardwood plantations. The larger the hardwood estate, the lower the per unit overhead costs (eg tree breeding programs are expensive), the lower the costs of wood delivered to a Western Australian pulp mill.

This does not mean to say that we should not seek other markets for forest products grown on farms. Total dependence on a wood fibre market, whether it be for pulp mills in Australia or overseas pulp mills, could place the industry in the same position as sawmillers who are dependent on the domestic green structural market. It is important that we explore potential markets for other products from plantation grown hardwoods so that we have a diversified market in the future.

For example, we have developed in CALM a process, VALWOOD, which can be utilised to produce laminated furniture grade timber from 10-year old *Eucalyptus globulus* plantations. Bunnings Pty Ltd already have produces high grade value added products from *Eucalyptus globulus* plantations using modifications of existing sawmilling and seasoning technologies.

We are also exploring other possible products, such as eucalyptus oil and tannin. It may be that the prospects of the production of liquid fuel from hardwood fibre is several decades beyond the horizon. But one of the characteristics of today's world is that sometimes horizons appear much more rapidly than we expected and we must have completed the research when the market opportunities arise.

G. THE INTEGRATED PACKAGE

The benefits of integration are difficult to explain because the major advantage of integration comes from interactions. It is also easy to talk about new approaches to forest management and utilisation. It's much more difficult to apply them. For this reason, I have attempted to use the Southern Forest Region of Western Australia - an area of over one million hectares of forest, wetlands and heaths - in an attempt to illustrate how integration may work in the real world. This is not to say that there are

not other parts of Western Australia, or the rest of Australia, which do not also provide excellent examples of integration in practice, or that we don't have critical problems with both forest management and the forest industries that remain unresolved in the southern forests of Western Australia.

1. It is indisputable that the existence of an integrated land management agency, responsible for management of all land in the Southern Forest Region, has removed major constraints on integration. All forest users have benefited from an integrated agency. In addition to removing the territorial boundaries which invariably form between separate government agencies, the increased scale and size of an integrated agency has given the forest managers in that region access to technology like the geographic information system, specialised skills like landscape architects who can address visual resource management problems, and a highly efficient public and internal communications system.

   The CALM/Australian Heritage Commission agreement is based on the Southern Forest Region. It would not have been impossible for the Australian Heritage Commission to reach agreement with separate government agencies in the Southern Forest Region, but it would have been an order of magnitude more difficult. The existence of a geographic information system applicable to all public land in the region was also a major technological aid to achieving the agreement.

   The agreement has been hailed, as you will be aware, by both sides of the political spectrum as a model for the rest of Australia. But our ability to work closely with the Australian Heritage Commission staff also provided specific

benefits for CALM. For example, the objective techniques they had developed to identify areas of special significance in the karri forest were used by CALM to respond to one of the environmental conditions imposed by the State's Environmental Protection Agency.

While in the Southern Forest Region we have had nowhere the amount of community conflict over forest use that has occurred in eastern Australia, it would be untruthful if I did not acknowledge that we had less than universal acclamation from some Western Australian conservation groups for either an integrated agency, or for that matter the agreement between the Australian Heritage Commission and CALM.

2. The positive effects of integration on the supply of hardwood logs to the forest industries, whose resource is derived from the Southern Forest Region, is readily quantifiable. Figure 8 shows the changes and projected supply of hardwood logs from this region in 1981, 1987 and 1992.

The 1981 projections illustrate what I have termed "the Lazarus problem". That is, the industry was being asked to accept major reductions in log supply in the medium term, while at the same time retaining the capacity to rise from their deathbed to capitalise on the huge resource which would come on stream in the middle and latter parts of the next century.

The proposed Forest Strategy is a major advance for the forest industry. It proposes to sustain the existing level of hardwood log offtake indefinitely. This is no small achievement, particularly when it is recognised that since 1983 there has been an over 300 per cent increase in the areas of forest (including the Shannon River National Park) from which timber harvesting is excluded.

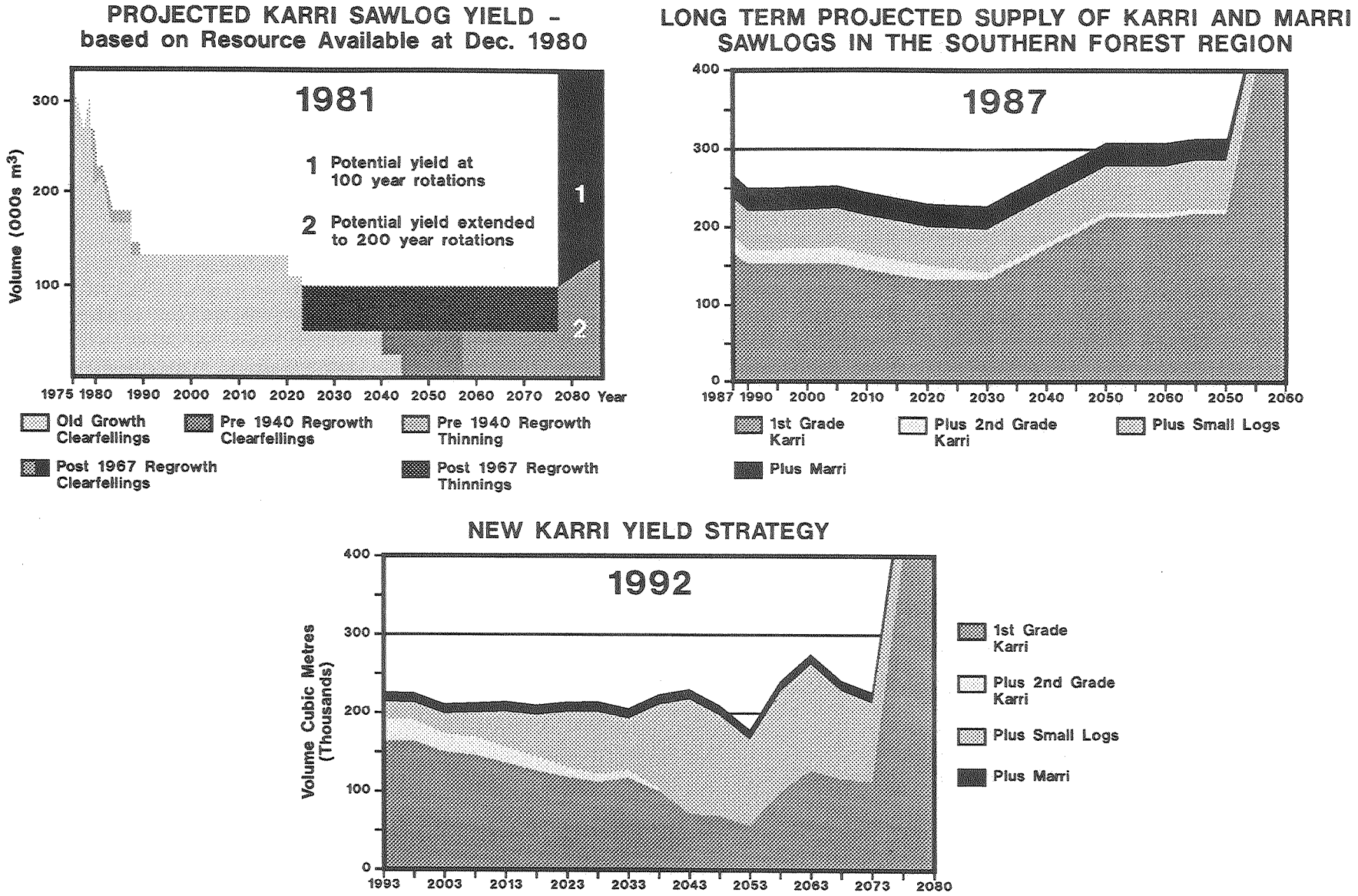


Figure 8. Changes in the projected sustainable hardwood log yield over time

There are a host of explanations as to how this was achieved, but some key ones are:

- Massive increases in utilisation in both the forest and the sawmills, which has been achieved in part by restructuring the pricing system and improvements in logging technology, which in turn result from very large investments by both sawmillers and logging contractors.

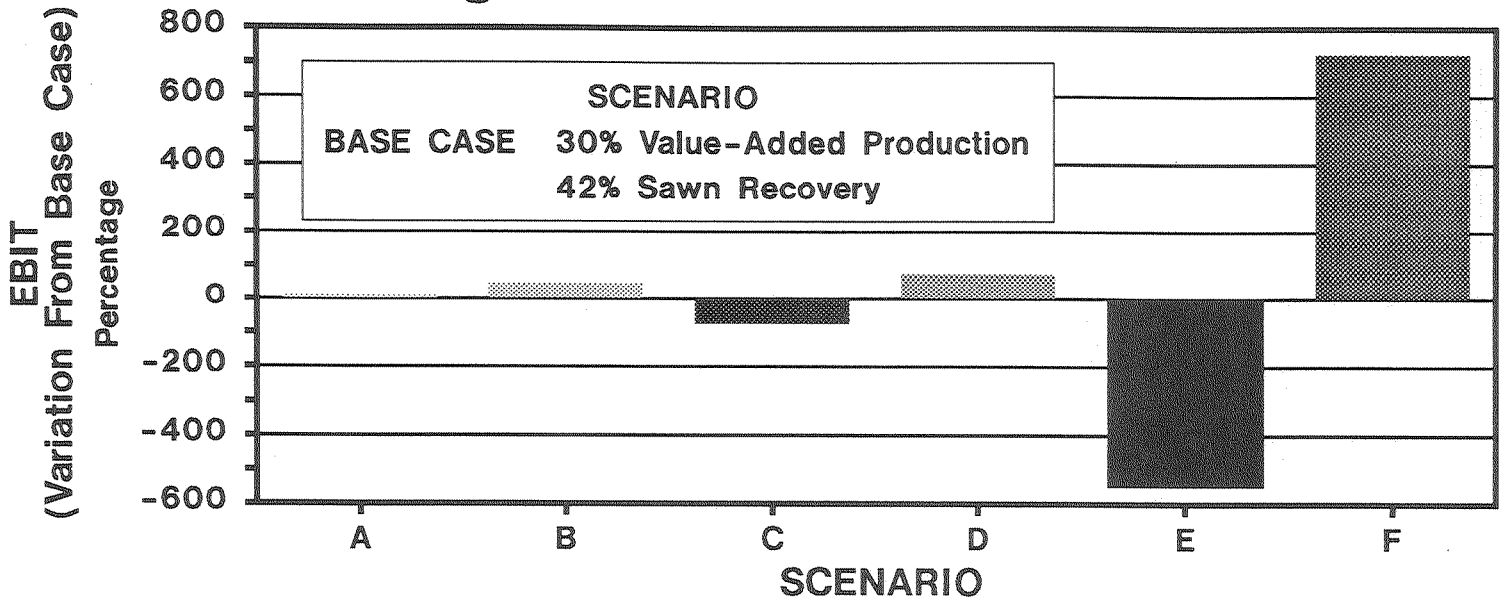
- Improved knowledge of the growth of trees, relationships between tree growth and site, and the application of sophisticated computer modelling systems.

- The improvements in utilisation which have enabled us to thin stands on schedule and to utilise trees that would previously have rotted on the forest floor, has also substantially increased the resource and reduced the time taken for regrowth forest to supply sawlog timber.

3. While the forest industries in the Southern Forest Region, like the rest of Australia are struggling under a recession, the prospects for significant increased profitability by greater integration are very large. For example, I have previously provided information on the effects of various utilisation strategies on the profitability of a sawmill, based on karri hardwood logs, {(Shea 1991) Figure 9}. None of the assumptions in scenario F are unrealistic, but all depend on an integrated approach to forest management and utilisation.

KARRI PROFITABILITY - SIX SCENARIOS

Earnings Before Interest And Tax



A No Value Added Production

B 47% Sawn Recovery

C No Market For Residue

D Residue Price Doubled

E No Market For Residue
No Market For Material

F 60% Value-Added Production
49% Sawn Recovery
Total Residue Use
Price For Dry Sawn Material Up By 62%
Production Costs Down 20%
Log Supply Costs Down 10%

Figure 9

For example:

- The investment required to achieve the improvements in technology in logging and sawmilling won't occur unless there is resource security. Security won't be delivered unless the community is convinced that the forest is being cared for and shared by all users - integrated forest management.

- The value added product levels proposed, and the price targets, depend on successful international marketing.

- Maximum utilisation (integrated utilisation) is a prerequisite for increased profitability.

- Reduction in forest management and log harvesting costs depend on integrating forest logging operations with forest management.

4. The most critical forest management issue in the Southern Forest Region is fire management. It would be pointless to provide for all forest uses by sensitive integrated forest management if we make the forest vulnerable to extensive wildfire. We have been able to avoid catastrophic wildfire in the past because, over a generation, forest managers have developed a superb fire protection system. But that system could be put at risk as we attempt to accommodate more sensitively, forest values such as, aesthetics by reducing our coupe size and increasing coupe dispersal. We have not solved this dilemma.

But our approach to resolving this is based on capitalising on the benefits of integration. For example:

- The successful suppression of wildfires depends on rapid access to large manpower and equipment, but like all public agencies we have resource constraints. But the introduction of integrated logging in Western Australia has provided access to the staff and physical resources of the logging industry. Training and integration of the logging industry into the wildfire suppression force is well advanced.

- The intensity of wildfires is exponentially related to fuel loads. Excessive logging debris results in greater fuel loads. Greater utilisation in the forest, in addition to increasing sawmilling and logging profitability, reduces fuel loads, hence wildfire risk.

- A linchpin of the current fire protection strategy is the protection of regrowth stands. Karri trees during early stages of development are fire sensitive and cannot be prescribed burnt to reduce fuel loads. But it is now possible, because of improved technology and marketing, to thin karri regrowth stands at a much earlier age profitably and without damage to the stand. Thinning ensures safe access, reduces aerial fuel loads and, because the canopy is opened, increases fuel drying and hence the length of the safe prescribed burning period. This may enable a proportion of regrowth stands to be converted from potential fire bowls to fire buffers by earlier introduction of prescribed burning.

CONCLUSION

There is no biological reason why Australia's native forests cannot continue to supply a large quantity of incredibly valuable hardwood logs forever. We are also seeing, both in forest management, timber harvesting, transport and the processing of forest

products, the invention and application of revolutionary technology. The world market for forest products is tough, but it is expanding. The forest industries will be prevented from entering the golden era if the broader community cannot be convinced that timber harvesting has a legitimate place in native forests. It will be no good winning that argument, however, if the products of the hardwood industry, as attractive as they are, cannot be sold at a profit.

The frustration is that there are a host of individual breakthroughs across the forest sector, which offer the tantalising prospect of solving both the political and economic problems of forestry. It is like being lost in a pitch black cave, gazing at millions of glow-worms on the roof, and knowing that if only we could combine their collective light into one torch we would find the way. Integration of all the breakthroughs into one package, will provide the quantum leap that forestry needs to launch it into a golden era.

It is our cultural and institutional mind-sets that are preventing integration, not biology or technology. We are all guilty and we all must change. I have no difficulty on behalf of all public agencies in the States that manage native forests, to tell you that we are eager to work with you to achieve the change necessary. This does not mean that we will collude with you to short-change other forest users. Quite the contrary. Your future and our future depends on ensuring that we not only care for our forests and share them equitably with all users, but the community also perceives that we do. Consequently, as it has been in the past, our relationships will at times be strained.

But the prize for the whole community is too big to allow sectional differences to prevent us working together to deliver it.

REFERENCES

CALM (1987). Timber Production in Western Australia. A Strategy to take WA's South-West Forests into the 21st Century. Department of Conservation and Land Management, WA.

CALM (1992). Management Strategies for the South-West Forests of Western Australia - A Review. Draft for Public Comment. Department of Conservation and Land Management, WA.

Shea, S.R. (1990). The need for a National Forest Strategy, or why can't our forest become Australia's magic pudding. Paper given to 13th All Australian Timber Congress, Perth, WA.

Shea, S.R. (1991). Adding Value to Timber Products, a Western Australian Perspective. Paper presented to the National Conference on Adding Value to Australia's Timber and Forest Products, Sydney, NSW.

Shea, S.R. (1992). Marketing "The Incredible Future of the Forest Industries". Paper given to Forest Industries Machinery Exposition 1992 Conference.

Projected Hardwood Log Offtakes

SUMMARY OF STATE TIMBER PRODUCT RESOURCES

	Sawlog (1000 m^3/yr)	Residues (1000 m^3/yr)
NSW	604	2000
VIC[3]	898.9	1959
QLD[2]	186	-
TAS	500	[4] 4300
WA[1]	959	1377
TOTAL	3147.9	9636

1. Potentially sustainable yields (1992 draft Forest Strategy).
2. Current allowable cut.
3. Estimated sustainable yields.
4. Potential yield.

SUMMARY OF TIMBER PRODUCT RESOURCES IN VICTORIA

REGIONS	1 SAWLOG	2 RESIDUES
	SUSTAINABLE YIELDS 1000's CUBIC METRES/YEAR	
CENTRAL GIPPSLAND	211	345
EAST GIPPSLAND	235	685
CENTRAL	125	200
MIDLANDS	77	185
TAMBO	78	270
DANDENONG	46	54
OTWAYS	44	60
WODONGA	27	41
WANGARATTA	24	38
PORTLAND	21	56
MID-MURRAY	5.6	NEA
BENALLA/MANSFIELD	3	25
BENDIGO	0.8	NEA
HORSHAM	0.8	NEA
MILDURA	0.7	NEA
TOTAL	**898.9**	**1959**

NEA means "no estimate available"

1. Sawlogs D grade and better.
2. Includes Pulpwood and E grade sawlogs.

SUMMARY OF TIMBER PRODUCT RESOURCES IN NEW SOUTH WALES

REGIONS	1 SAWLOG	2 RESIDUES
	SUSTAINABLE YIELDS 1000's CUBIC METRES/YEAR	
ALBURY	62	180
BATEMANS BAY	41	120
BATHURST	12	35
COFFS HARBOUR	147	430
DUBBO	69	202
EDEN	53	390
GLEN INNES	61	178
NEWCASTLE	40	117
PORT MACQUARIE	119	348
TOTAL	**604**	**2000**

SUMMARY OF TIMBER PRODUCT RESOURCES IN QUEENSLAND

REGIONS	1 SAWLOG	2 RESIDUES
	SUSTAINABLE YIELDS 1000's CUBIC METRES/YEAR	
NORTH	0	NEA
CENTRAL	50	NEA
SOUTH WEST	13	NEA
SOUTH EAST	123	NEA
TOTAL	**186**	**NEA**

NEA means "no estimate available".

SUMMARY OF TIMBER PRODUCT RESOURCES IN TASMANIA

REGIONS	1 SAWLOG	2 RESIDUES
	SUSTAINABLE YIELDS 1000's CUBIC METRES/YEAR	
CROWN LAND (includes 10000m^3)	300*	2100
PRIVATE PROPERTY**	200	2200
TOTAL	**500**	**4300**

*First grade eucalypt sawlog, 70 000m^3 of second grade sawlog is included in residue.

**Twenty per cent yield with conversion to plantation to maintain yields.

SUMMARY OF TIMBER PRODUCT RESOURCES IN WESTERN AUSTRALIA

REGIONS	1 SAWLOG	2 RESIDUES
	SUSTAINABLE YIELDS 1000's CUBIC METRES/YEAR	
JARRAH	675	685
KARRI	214	203
MARRI	70	489
TOTAL	**959**	**1377**

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