



Australia's Ever-Changing Forests II

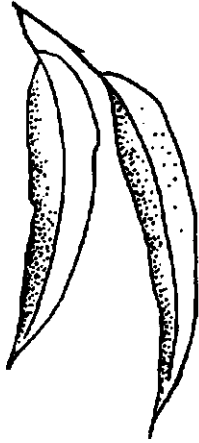
Proceedings of the Second National
Conference on Australian forest history

Edited by

John Dargavel and Sue Feary



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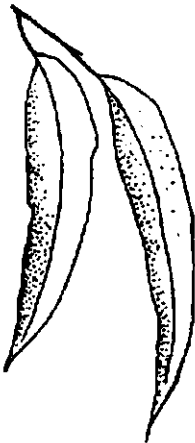


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PREFACE

Much has happened since the inaugural conference on forest history was held in 1988 and the Forest History Society was formed. As the Society's newsletters show, both State and Federal heritage bodies have directed considerable funds towards forest based research, in an attempt to resolve the on-going conflict between conservationists and the timber industry over the management of hardwood forests. The Society provides a forum for bringing together this research and giving it an historical perspective. Stimulated by the expanding body of information on forests and the success of the first conference, several Society members formed a committee and began planning a second. Because of the multi-disciplinary nature of forest history, soliciting papers was not difficult and by mid-1992 it was apparent that the second conference would be as interesting as the first.

This volume presents the proceeding of the conference which was held on 3-5 December 1992 at the Victorian School of Forestry in Creswick, Victoria. The conference objectives were to facilitate information exchange and develop a holistic outlook across a broad range of forest related disciplines. The emphasis on bringing together the diverse approaches used to investigate the natural and cultural environments of forests can provide a valuable framework for developing management practices which take account of past natural and cultural events. The discerning reader will notice some differences when comparing the scope of papers from the two conferences. This volume is more focussed on *forestry* history rather than *forest* history, illustrating perhaps the difficulties of maintaining a nexus between the natural sciences and culture history.

In his opening address Frank Moulds described the historical significance of the School which has trained foresters since 1910. He noted that the forests surrounding Creswick have been a major economic, cultural, social and environmental factor in the evolution of the district. The town and surrounds have produced some famous people such as the Lindsay family (Norman, Lionel, Percy and Ruby), Sir Alexander Peacock, three times Victorian Premier - John Curtin, Sir Marcus Oliphant, Leach (of Leach's bird books), and Professor Laby, noted physicist, who were all born here. The locality has become a major force in developing skills in land management, especially forests - both hardwood and softwood - which are of substantial and continuing benefit not only to Victoria, but Australia-wide and even overseas. Many graduates of the School have made significant contributions well beyond the boundaries of Victoria.

Dr Moulds quoted from a recent lecture given by historian Michael Howard to demonstrate the need for historians to be impartial when studying the past:

Our agenda is set by current controversies whether we wish it or not. If we take part in them, we have no right to claim that our historical studies provide a kind of inner light denied to lesser mortals. Historians are as prone as anyone else unconsciously to formulate conclusions on the basis of temperament, prejudice and habit and then collect the evidence to justify them. It would be dishonest to pretend otherwise.

He ended his address with a salutary warning, that forest historians must not become antiquarians, studying the past for its own sake, but should learn lessons from the past to seek a philosophy for the future.

Eighteen papers covering a range of topics were presented over the two days. In one way or another, all the papers reflected a common thread, that today's forests are the result of a long history of complex interaction of human beings with their environment, whether it be with a spear or a chain saw. For example, Anita Brady showed how archival research of land titles, fire and logging histories were used to identify the remaining patches of old growth forest in East Gippsland. Tom Griffiths in his elegant description of Victoria's mountain ash forests pointed out the need for historians to see forests as being part of the historic process and not just a backdrop to it. There were some interesting international links; Michael Roche, et al enlightened us about the connections between New Zealand Kauri and Western Australian Karri and Sue Feary illustrated a more tenuous link between forest management practices in 9th Century Europe and those on the NSW south coast in the 1960s. One session was devoted to a series of short 'work in progress' presentations. These will appear in subsequent issues of the newsletter.

Three field trips complemented the papers. There was a guided tour of the Forestry School by Simon Walley, and Jane Lennon led us through the adjacent demonstration forest. This contains evidence of the various silvicultural practices that are taught at the School, as well as some excellent examples of alluvial gold diggings and water races from the nineteenth century. Most of us took to the bush on the last day for a trip through Wombat State Forest, where we were shown modern silvicultural practices and a range of historic sites. Visits to Boase's and Black Forest sawmills demonstrated the massive technological differences between the more traditional (at the former) and the ultra modern.

The Society held its meeting on 4 December, when it agreed to continue as a non-aligned organisation run by its convenors. Les Carron, John Dargavel, Sue Feary and Kevin Frawley, the first convenors, passed over the reins of the Society to Anita Brady and Stephen Legge. Enquiries about the Society should

be directed to Anita Brady, Historic Places Branch, Department of Conservation and Natural Resources, 240 Victoria Parade, East Melbourne 3002.

Ettie Oakman and Fay Goddard of the Centre for Resource and Environmental Studies transformed the varied conference papers into these proceedings with care, great skill and much hard work. We thank them sincerely.

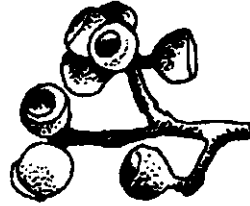
We hope that readers of these proceedings will gain some appreciation of the importance of conferences such as this, which bring together practitioners from the natural sciences and human history. The meeting of these disciplines is essential for the long term protection and management of our precious forest legacy.

John Dargavel and Sue Feary

August 1993.



Early Perceptions



CHAPTER 1

NINETEENTH CENTURY PERCEPTIONS OF VICTORIAN FORESTS: IDEAS AND CONCERNS OF FERDINAND MUELLER

Linden Gillbank

I regard the forest as an heritage given to us by nature, not for spoil or to devastate, but to be wisely used, reverently honoured, and carefully maintained. I regard the forests as a gift, intrusted [*sic*] to any of us only for transient care during a short space of time, to be surrendered to posterity again as an unimpaired property, with increased riches and augmented blessings, to pass as a sacred patrimony from generation to generation (Mueller 1871b: 96).

From 1853 until his death in 1896, Dr Ferdinand Mueller was Victoria's first Government Botanist. From 1857 to 1873 he was also Director of Melbourne's Botanic Gardens and National Herbarium. In 1870 he became Baron Ferdinand von Mueller. He spent almost half a century exploring, cataloguing, and considering uses for Australia's indigenous flora, including the forest flora. Via his contact with scientists, collectors and saw millers, his involvement in international exhibitions and royal commissions, and his stream of botanical speeches and publications, Mueller shaped scientific and public perceptions of the flora. During his time as Government Botanist he was often involved in discussions about the use and management of forests. This paper examines Mueller's ideas and perceptions of Victorian forests, forest products and forest practices.

As many papers in this volume demonstrate, an understanding of the forested landscape is enhanced by a knowledge of the history of that landscape. Likewise for ideas and practices. An understanding of past forest practices and perceptions allows us to examine those currently in vogue with greater wisdom. Only with an understanding of the past can we appreciate to what extent our ideas, practices and concerns are novel - to what extent they are born of our times. Mueller's was an authoritative and influential nineteenth century botanical voice. As such his ideas about forests are of both historical and comparative interest.

To what extent did his ideas presage current attitudes and concerns?

It is easy to read the words which Mueller spoke and wrote regarding forests in the second half of the nineteenth century. However to fully understand the meanings he wished to convey via those words, we in the late twentieth century must relinquish, must erase from our minds, certain ideas and attitudes appropriate to the present but quite inappropriate to the previous century. We must turn back our mindset by a century and a half to pre-ecological and pre-petrochemical times. Then the world was overtly and directly dependant on its flora to satisfy many human needs - food, drugs, clothing, shelter, transport, and power. The chemical plant had not yet gained its ascendancy over the botanical plant. Forests were recognised as important sources of various plant products, including timber, oil, and resin.

In the mid-nineteenth century Nature was appreciated for its generous provision of a grand diversity of botanical resources around the world. However, it was widely argued that the distribution of those resources could and should be improved. To enhance human survival and comfort, exotic plants should be introduced into regions not adequately blessed by Nature. By the mid-nineteenth century the science of plant taxonomy was sufficiently developed to allow the accurate recognition and description of plants in the wild, and the selection and transfer of known species to new landscapes. Magazines and newspapers kept readers informed of the discovery and naming of new species, and of their introduction into alien lands. Botanical information and material were speeding round the world. Forest species, with known requirements for cultivation and with known characteristics, eg. timber type or drug production, could now be successfully sought for introduction. An adequate plant taxonomy underpinned a flourishing forest industry.

By the 1860s the term 'ecology' had been coined and defined. However, not until the beginning of the next century, was the science of ecology emerging as a respected sister discipline to plant taxonomy. An awareness of the environmental disasters - soil erosion, drought and disease - which had followed deforestation in the wake of European exploitation of such verdant places as Mauritius, St Helena, Jamaica and Barbados had lead to the widespread perception that forests increased rainfall and prevented soil erosion. In 1764 on the Caribbean island of Tobago about 20 per cent of the island was 'reserved in wood for rain' (Grove 1992). Following horrific droughts in India and South Africa in the early and mid-nineteenth century, the desiccation theory was widely espoused. Many scientists were convinced that deforestation was responsible for aridification and temperature change on a global scale (Grove 1988, 1992). The links between forests and rainfall and soil conservation were firmly etched in many mid-nineteenth century minds. Even in these pre-ecological times



Ferdinand von Mueller c.1875
(National Herbarium)

interactions between plants, soil and climate were recognised. Following the permanent demise of the dodo in its only home - Mauritius - in the seventeenth century, and other creatures elsewhere, there was also an awareness that species could become extinct. This was the climate of ideas in which Ferdinand Mueller thought and worked in Victoria in the second half of the nineteenth century.

Ferdinand Mueller was the epitome of the nineteenth century botanist. His ideas reflected those of his times and covered a very broad spectrum of botanical wisdom. He attempted to communicate with as many botanical institutions and individuals as possible, and kept up to date with the latest published and unpublished word on forests and forest plants. He could see the precious wood (and other forest values) for the trees. Mueller's understanding of plants and of forests allowed him to simultaneously recognise and intelligently integrate several important visions of a forest - reverential, environmental, biological, and economic.

His biological perception of a forest was of a group of plants with specific biological needs, eg. conditions required for regeneration or increased productivity. His economic vision was of the useful products which could be extracted from the forest and of the forest industries which could thereby be developed. Mueller also recognised ways in which forests exerted a beneficial influence on various aspects of the environment. But forests were more than useful types of vegetation. As beautiful parts of the Creator's work, they were also to be revered and marvelled at.

Mueller shared a not uncommon nineteenth century philosophy that information and resources should be made available to the public. Science and plants were for the people. Mueller saw his duty as Government Botanist to provide his fellow colonists with botanical information and plants and to ensure the continued colonial provision of the widest possible range of botanical products from farm and forest. In the small community and tiny scientific community of Melbourne it was not difficult for Mueller to make his arguments heard. He spoke on forestry matters at scientific and public meetings, with some of these speeches being reported in newspapers and other publications. He wrote reports, articles, chapters and books. He prepared exhibits of forest products for Melbourne's National Herbarium, and various exhibitions, and acted as commissioner and juror for some of them. He participated in Boards of Inquiry and Royal Commissions on forestry matters. Some of Mueller's forest-focussed activities are listed in Table 1. His 1871 museum lecture provides the main focus of this paper, with some discussion of the 1861 exhibition and the 1885 Royal Commission.

Mueller's imprint on Australian forests endures in the names he gave to many forest trees. Victorian eucalypts which still bear Mueller's names include *Eucalyptus behriana*, *E. fasciculosa*, *E. gracilis*, *E. largiflorens*, and *E. leucoxyton*, which he named in 1855, *E. regnans* (1871) and *E. bosistoana* (1895). Mueller is commemorated in the forests of Gippsland by *E. muelleriana*, which Alfred Howitt named after him in 1891.

Table 1 Some Victorian forestry activities of Ferdinand Mueller

1854	Exhibition
1861	Exhibition
1866	Exhibition
1867	State Forests Inquiry
1870	Industrial and Technological Museum Lecture
1871	Industrial and technological museum Lecture
1871	Foreign industries and forests Inquiry
1876	Wattle Bark Inquiry
1880	Social Science Congress Lecture
1885-92	Vegetable Products Inquiry
1890	Australasian Association for the Advancement of Science Lecture
1895	Australasian Association for the Advancement of Science Lecture

1861 Victorian Exhibition

One important exhibition in which Mueller was involved and was responsible for a strong forestry presence was held in Melbourne in 1861. In preparation for the International Exhibition of Agricultural and Industrial Products to be held in London in 1862, an exhibition was held in Melbourne in 1861 to select Victoria's agricultural and industrial exhibits for the London Exhibition. Ferdinand Mueller, MD, PhD, FRS joined the group of illustrious gentlemen Commissioners of the Exhibition, and was one of seven authors of prefatory essays on the 'Progress, Resources, and Physical Characteristics of the Colony' for the Exhibition Catalogue. With information about the colony never before put together in a single volume, the catalogue was heralded as 'a history of the past, a record of the present, and a prophecy of the future'.

Mueller's essay 'The Vegetation of the Colony, especially in reference to its resources' contained the primordium of his visions of Victoria's forests, ideas which he would develop more fully in future decades. It mentioned various forest products - eucalyptus oil, kino resin, roofing bark and tanners' bark, as well as timber. Mueller (1861) was hopeful for Victoria's forestry future:

The timber resources of our colony are almost unbounded, although our forests are devoid of the larger coniferous trees. Eucalypti, often of colossal size and of great durability, including

vast quantities of the blue gum tree (*Eucalyptus globulus*), will yield in future their timber also for foreign markets, whenever the ramifications of the railway system will have brought the forests more widely into contact with the harbors.

Mueller's influence on the Melbourne Exhibition was formidable. He was on the three-man committee for Class III exhibits - 'indigenous vegetable products, and the manufactures and processes connected therewith' - in which timber featured prominently. About 90 of the then known 120 species of forest trees were represented, the botanical accuracy of whose names was Mueller's responsibility. Half of the 140 timber exhibits were from 'The Commissioners', which included Mueller. Mueller was named as the exhibitor of six other timber specimens - *Acacia Riceana* and *Callistemon salignus* (stonewood) from Wilson's Promontory, *Melaleuca squarrosa* and *Elaeocarpus cyaneus* from Gippsland, *Eucalyptus viminalis* (manna gum) from Port Phillip, and *Eremophila Mitchellii* from the Murray desert. Mueller also provided exhibits of other vegetable products - resin from *Xanthorrhoea Australis* (grass tree), gum from two wattles, *Acacia mollissima* and *A. pycnantha*, bark from *Atherosperma moschatum* (sassafras), and fibres from *Pimelea axiflora* and *Sida pulchella*. As a Commissioner for the 1854 Victorian Industrial Exhibition which preceded the first Paris Exhibition, Mueller had induced his friend, Joseph Bosisto, to distil the oil of a single species of eucalypt. In the 1861 exhibition, Mueller prompted Messrs Bosisto and Johnson to extract volatile oils, this time from dozens of species, and supplied the leaves for the oil exhibits, to remove any uncertainty about the botanical names of the parent plants. 'For services rendered in collecting Specimens of the Timber Trees of Victoria' Dr Mueller received a Supplementary Award - a First Class Certificate. In their report on the vegetable products (class III), the three jurors acknowledged their indebtedness to Dr Mueller for his invaluable botanical information.

1871 Museum Lecture

A decade later Baron Ferdinand von Mueller, CMG, MD, PhD, FRS discussed his ideas and concerns about forestry in a lecture delivered in Melbourne's Industrial and Technological Museum. His lecture was titled 'Forest Culture in its Relation to Industrial Pursuits'. Mueller (1871b) began his talk with his concerns:

Strange as it may appear, an impression seems to be prevailing in these communities, that our forests have to serve no other purposes, but to provide wood for our immediate and present wants, be it fuel or timber. For even after the warning of climatic changes, and after the commencing scarcity of wood, no forest administration - at least, none adequate, or regularly organised -

has been initiated in any portion of Australia; and thus the forests, even in districts already very populous, remain almost unguarded, become extensively reduced, and in some localities are already annihilated; indeed, the requirements of the current time alone are kept in view. Under such circumstances it cannot be surprising, that neither an universal forest supervision, not a judicious restraint of consumption, nor an ample utilisation of all the various collateral resources of our woodlands, received that serious attention to which such measures became more and more entitled.

It was the 22nd of June 1871, and Mueller was speaking on the strength of almost two decades of experience as Government Botanist and resident of Victoria - two decades in which he had featured forest products in exhibitions and discussed forest management in government reports and public lectures, and had observed the demise of many forests to satisfy the goldmining industry's voracious appetite for fuel and timber. Mueller used images and objects to impress his museum audience. His lecture was illustrated by pictures of Californian and Himalayan pines, by various young trees which he recommended for forest culture and samples of their timber, by 'numerous technologic forest products and phytochemic preparations', and by nets and baskets prepared from forest grasses.

Mueller's ideas in 'Forest Culture in its Relation to Industrial Pursuits' reached beyond the museum lecture room and the 22 of June 1871. His lecture was later published by the Museum and extracts also appeared in *The Gardeners' Chronicle and Agricultural Gazette* in December 1871 and January 1872, and in *The Pharmaceutical Journal* in January and February 1872. His lecture was even read on the other side of the Pacific ocean. In 1875, as President of the Santa Barbara College, California, Ellwood Cooper addressed the College Association on a subject dear to his heart - 'Forest culture and the Australian gum tree'. He was so concerned about the need to protect forests and so impressed with Mueller's ideas, that the following year, in front of the fifth annual catalogue of his college, he published the text of his own forest talk and four of Baron von Mueller's (Cooper 1876). Included was 'Forest Culture in Relation to Industrial Pursuits'.

Mueller's 1871 museum lecture encapsulated his forestry ideas, many of which he maintained for much of his botanical life. It was, as Mueller's talks often were, long and information-laden. As the above introduction to his talk shows, Mueller was concerned to recognise the importance of forests beyond their provision of the colony's immediate wood requirements. While timber and other forest products were crucial for colonial economic and social progress, other forest values also deserved recognition. He discussed environmental and para-

disic as well as biological and economic aspects of the forest.

Mueller (1871b) described some of the ways in which forests beneficially affect the environment. They arrest passing miasmata (noxious exhalations) and limit the spread of corn rust spores, while their feathered singers obstruct the march of armies of locusts and other insect pests. They moderate the temperature and increase humidity. They increase the rainfall, and soil moisture and humus, create and conserve soil, and maintain the sources of water flow. Thus, although an ecological framework was not available to Mueller to examine the forest vegetation, like other botanists, he recognised relationships between forests and certain environmental factors. Mueller was keenly aware of the place of the forest in Nature's great economy.

Mueller (1871b) expressed his determination as Government Botanist to best serve his fellow colonists in all matters botanical, which included the creation, regeneration, enrichment and maintenance of forests. In order to ensure adequate forest management to perpetuate and enhance forest resources, Mueller suggested that forest administration should be carried out by local Forest Boards, whose honorary local members would have some forestry knowledge as well as a commitment to the present and future welfare of the locality. Mueller (1871b:53) argued that:

Each forest district, thus guarded by local administrators, will be able to produce a far larger income than now is raised from any of our wood areas; while the removal of timber will be bought within more reasonable bounds, and the wants of the future no longer be disregarded.

Each forest district should also have some fertile, sheltered valleys reserved for forest nurseries to provide the millions of indigenous and exotic tree seedlings needed for forest creation, regeneration and enrichment. Mueller's arguments for forest management were strengthened by his knowledge of environmental disasters following the demise of forests in other countries, and the conservation efforts of other botanists. He recommended that one quarter of Victoria be kept forested, which he calculated would contain 1,568,000,000 trees. This he thought would be adequate for the extraction of the colony's timber and other forest products and the 'timely restoration in proportion to their removal or natural loss'. Mueller was keen to have the colony able to satisfy its own timber requirements.

Mueller was constantly balancing his biological and economic perceptions of the forest. Mueller (1871b) combined his understanding of the biology of forest plants, both indigenous and exotic, with his knowledge of local and colonial requirements for forest products. Despite the length of his talk, Mueller explained that time did not allow a comprehensive discussion of the value of

indigenous timber, which, he said, could fill a volume, nor of exotic trees which were suitable for introduction to enrich Victoria's forests. The Acclimatisation Society of Victoria had just published Mueller's list of such trees (Mueller 1871a), a list which he would later develop into a much sought-after volume, *Select Extra-tropical Plants readily eligible for Industrial Culture or Naturalisation*, which would be enlarged in numerous successive editions.

Mueller (1871b) did manage to mention a range of non-timber plants capable of 'enriching the resources of our woods': China and Assam tea, cork oak, saffron, opium poppy, hops, various fruit and nut trees, strawberries, raspberries and blackberries, truffles, cinchona (quinine) tree, and pea-nut. Many of these Mueller had already successfully grown in Melbourne's Botanic Gardens or elsewhere, and opium and hops were already in production in Gippsland. While not considering forest timber, Mueller (1871b) spent some time discussing a range of collateral forest products. His suggested technologic products included charcoal, tar, vinegar, acetic acid, alcohol, paraffin, potash, eucalyptus oil, gum-resin, and tannin. He also suggested the collection of tree-seed and fern-trees. He emphasized that he definitely did not advocate 'an indiscriminate sacrifice of our forest-trees for any solitary one of its [non-timber] products', nor 'the vandalism of denuding every one of our fern-glens of its pride'. His suggestions for forest industries were informed by his knowledge of useful plants from around the world. Mueller saw it as his duty as government botanist to make available to his fellow Victorians as much of the world's wealth of botanical resources as was geographically and economically possible. Victoria's forests must be enriched with those desirable exotic plants which Nature had not managed to incorporate into them. Since Victorian forests were deficient in softwood trees, Mueller was particularly keen to introduce a wide range of pines to the alps. He mentioned the Norway spruce, silver fir, larch, Weymouth fir, Douglas pine, and the pitch pines of North America.

Mueller (1871b) provided a welter of statistics to substantiate his arguments for the careful and less wasteful management of forests and their enrichment with desirable exotic plants. He provided detailed figures for annual domestic, gold-mining and railway timber requirements and the annual cost of imported timber, most of which was softwood. He also questioned the reliability and permanence of the sources of Victoria's imported timber. Although he did not use the terms, Mueller sought to encourage the long term sustainable development of forest industries and colonial self-sufficiency in the production of timber and other forest products.

Mueller's perceptions were farsighted. Forests must be managed, not just to satisfy the needs of the present generation, but for posterity. Mueller was persistent in his argument for the control of forest exploitation and the concomitant development of forest industries to satisfy colonial needs. Since forest

industries were only as lasting as the forest plants on which they were based, control was essential for the continuing survival of both the forest and its industries.

Mueller (1871b:94) ended his talk with a discussion of non- utilitarian forest values:

Beyond the plainly utilitarian purposes of our forests (some of which I endeavoured briefly to explain), and beyond all the important functions which the woods have to perform in the great economy of nature, they possess still other claims on our consideration, such as ought to evoke some feeling of piety towards them.

The silent grandeur and solitude of a virgin forest inspires us almost with awe, much more so than even the broad expanse of the ocean. It conveys also involuntarily to our mind a feeling as if we were brought more closely before that Divine Power by whom the worlds without end were created, and before whom the proudest human work must sink into utter insignificance.

Mueller was impressed with the 'almost paradisiac features of sylvan scenery'. He ended his museum lecture with the mind- and soul-generated summary of his perceptions of the forest which heads this paper.

A month after his museum lecture, Mueller was appointed to a Commission to report on the introduction into Victoria of rural industries then common and profitable in Europe.

And to further consider and report on the best means of promoting the culture, extension, and preservation of State forests in Victoria, and the introduction of such foreign trees as may be suitable for the climate and useful for industrial purposes (Duffy 1871).

The Commission's Progress Report included many of the suggestions Mueller had made in his museum talk - to stop wasteful practices associated with tree felling and bark stripping, to increase the number of State Forests, the establishment of forest nurseries, the establishment of forest reserves in unwooded districts, and the formation of local Forest Boards. It also recommended many of the various collateral forest products which Mueller had suggested in his museum lecture (Bindon et al 1871).

1885 Royal Commission

A decade and a half later, Sir Ferdinand von Mueller, KCMG, was invited to present evidence to the Royal Commission on Vegetable Products. Mueller (1885) had already prepared, specially for the Commission, the sixth English language edition of his *Select Extra-Tropical Plants*, all of whose 1,000 copies had been sold in seven months. Mueller (1887) was asked to give his views:

with reference to forest conservation, the replanting of forests, and generally as to the subject, in order that it may be taken up in a more satisfactory way in the future than it has been in the past.

The Commissioners thought it right that, as a special expert, Mueller should be the first witness. In his evidence, both verbal and written, Mueller (1887) reiterated many of the ideas and concerns which he had expressed in his 1871 museum lecture, and referred to that lecture as one of four of his reports on which a system for the management of Victoria's forests could be based.

Victorian forests still deserve the care and concern that Ferdinand Mueller expressed last century. With an ecological understanding of forest vegetation, we can ensure that Mueller's hopes are realised. Into the 21st century we must determine the extent to which we can exploit without destroying our forests.

Acknowledgments

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CHAPTER 2

TALL STORIES AND TALL TREES

Frank R Moulds

Damage done recently, either accidental or deliberate, to a large mountain ash (*Eucalyptus regnans*) tree in the Powelltown locality has drawn attention to the once prevalent very tall trees of Victoria. The discovery and recording of these is an interesting story. Their subsequent demise is unfortunately one of the prices of progress and the inevitable result of massive wildfires such as those of 'Black Friday' January 13th 1939, 'Ash Wednesday' February 16th 1983, and numerous other somewhat less disastrous outbreaks in earlier years. None of the very tall mountain ash trees which exceeded 300 feet (91.4 metres) referred to in the literature of the nineteenth century and the early part of the present century are still standing. However as a result of forest fires especially those of 1919, 1926, 1932 and particularly 1939, significant areas of mountain ash regrowth now contain trees of up to 250 feet in height which are still in vigorous growing condition. The time has probably now arrived for a search for a new generation of tall trees approaching the previous magical figure of 300 feet. Possibly by now the 300 foot tree is again becoming a part of our forest history.

Public interest in large trees dates from the early 1860s. The late K.J. Simpfendorfer of the Forests Commission, Victoria, gathered together much of the information on this subject in 1982. His work followed on and included a summation of years of records of tall trees accurately kept by A.D. Hardy of the Forests Commission from about 1918 to 1940. Baron Ferdinand von Mueller wrote in 1866:

The marvellous height of some of the Australian, and especially Victorian trees, has become the subject of closer investigation since of late, particularly through the miners' tracks, easier access has been afforded to the back-gullies of our mountain system. Some astounding data, supported by actual measurements are now on record. The highest tree previously known was a Karri-Eucalyptus (*Eucalyptus colosseae*), measured by Mr Pemberton Walcott, in one of the delightful glens of the Warren River of Western Australia, where it rises to approximately 400 feet high.

Into the hollow trunk of this Karri three riders, with an additional packhorse, could enter and turn in it without dismounting. On the desire of the writer of these papers, Mr D Boyle measured a fallen tree of *Eucalyptus amygdalina*, in the deep recesses of Dandenong, and obtained for it the length of 420 feet, ... while Mr G Klein took the measurement of a eucalyptus on the Black Spur, ten miles distant from Healesville, 480 feet high!

Mr E.B. Heyne obtained at Dandenong measurements of the height of a tree of *Eucalyptus amygdalina*. Length of stem from the base to the first branch, 295 feet; diameter of the stem at the first branch, 4 feet; length of stem from first branch to where its top portion was broken off, 70 feet; diameter of the stem where broken off, 3 feet; total length of stem up to place of fracture, 365 feet; girth of stem three feet from the surface, 41 feet. Mr George W. Robinson ascertained in the back-ranges of Berwick the circumference of a tree of *Eucalyptus amygdalina* to be 81 feet at a distance of four feet from the ground, and supposes this eucalypt, towards the sources of the Yarra and Latrobe rivers, to attain height of half a thousand feet ... A standard of comparison we possess is the spire of the Munster of Strassburg, the highest of any cathedral of the globe, which sends its lofty pinnacle to the height of 466 feet, or in the great pyramid of Cheops, 480 feet high, which if raised in our ranges would be over-shadowed probably by eucalyptus trees.

It is interesting to note the standards of comparison which were chosen by von Mueller in 1866 before skyscrapers and the Eiffel Tower were created. Also interesting, as will be seen later, is that almost all of the great heights claimed by von Mueller, largely on anecdotal evidence, have been shown to be considerably exaggerated, in some cases by 100 per cent.

Brough Smith in 1869 referring to the forested areas of Victoria wrote:

In the lofty ranges bordering the basin of the River Yarra, where rains are frequent, the climate moist, and the soils rich, there are very large trees ... In one instance I measured with the tape line one huge specimen that lay prostrate across a tributary of the Watts, and found it be 435 feet from its roots to the top of the trunk. This tree has been much burnt by fire, and I fully believe that before it fell it must have been more than 500 feet high. As it now lies, it forms a complete bridge across a deep ravine.

The Melbourne *Age* newspaper of Thursday, February 22, 1872 published the following article:

STATE FORESTS OF THE WATTS RIVER

The Assistant-Commissioner of Lands and Survey having instructed Mr Ferguson to make an inspection of the timbered ranges in the watershed of the Watts River, with a view to the proclamation of a State forest, that gentleman has forwarded to the Assistant-Commissioner the following interesting report relative to such inspection (Melbourne Botanic Garden, 21 February, 1872).

To Clement Hodgkinson, Esq., Assistant-Commissioner of Lands and Survey.

Sir, - Referring to your suggestion of the 12th inst., I took the earliest opportunity of acting upon them, and accordingly, on the 15th inst., I proceeded to the Watts River, and carefully inspected the heavily-timbered country, extending from Mount Monda to Mount Juliet, also the various spurs and tributaries of the Watts, extending as high up as the crest of the dividing range and the watershed of the Goulburn River.

I have now the honour to report that a very large extent of the above country is densely timbered with various species of Eucalypti, consisting principally of *Eucalyptus obliqua*, *E.amygdalina*, and *E.goniocalyx*.

In many places I observed large areas where the axe of the splitter is yet unknown, and where the timber averages from 100 to 150 trees per acre, with a diameter of from 2 feet to 6 feet and from 250 feet to 300 feet in height, the most of which is as straight as an arrow, with very few branches.

Seeing that such large quantities of valuable timber abound in the valley of the Watts and on the Spurs adjacent, I would respectfully beg to recommend the reservation of every acre, wherever it would not interfere with settlement, for, as a whole, the timber in the locality of the Watts, and ranges adjacent, is of far more value than the land, and is rare to find such forests of sound timber in any other part of Victoria.

I have the honour to be, Sir, your most obedient servant, William Ferguson, Inspector of State Forests.

Extracts of this report were published in *Victoria and Tasmania*, by Anthony Trollope, published by Chapman and Hall, London in 1874.

Interest in large trees continued unabated, and was further stimulated by the display of a large stump at the 1888 Centennial Exhibition in Melbourne. Measurements and photographs were taken of some of the larger trees and were reproduced in *The Giant Trees of Victoria*, published by the Victorian Government, but undated and with no reference to the author. The introductory page however gives some information and indication of the public interest in large trees:

THE GIANT TREES OF VICTORIA

The existence in Victoria of trees, of the Eucalyptus species, some hundreds of feet in height had been known for many years prior to the holding of the Centennial International Exhibition in Melbourne during 1888. Rumours were current that trees had been seen towering to a height of over five hundred feet, with circumferences ranging from seventy-five to one hundred feet. Up to that time, however, no systematic endeavour appears to have been made to obtain accurate measurements or photographs of these giants of the forests ...

It would appear that Mr N.J. Caire, Photographer, of Toorak Road, South Yarra, was the only person who had attempted to obtain negatives of some of the well-known specimens. Dr Dobson therefore communicated with him on the subject, with the result that Mr Caire, in August 1887, wrote a letter to the Executive Commissioners for the Centennial Exhibition, making certain suggestions with regard to obtaining such photographs, and offering to supply them under certain conditions duly set forth therein. No active steps were taken, however, until March, 1888, when the matter was brought before a meeting of the Vegetable Products Committee of the Exhibition Commissioners.

In the meantime Dr Dobson had laid his views before his colleagues the Trustees of the Public Library, and the Honourable J.L. Dow, Minister of Lands. Contributions were promised in each case towards the necessary expenditure. The Honourable James Munro, Executive Commissioner of the Centennial Exhibition, and Chairman of the Vegetable Products Committee, was requested to complete all requisite arrangements; and, after an interview with the above-named gentlemen, it was finally decided that the Lands Department should contribute £400, the Trustees of the Public Library £100, and the Exhibition Commissioners £100

- in all £600 - for the purpose of obtaining a series of photographs of the highest known trees, together with reliable measurements. The Lands Department further undertook to supply, by the photo-lithographic process, any number of copies that might be required, the negatives to become the property of that Department at the close of the work. In June 1888 advertisements were inserted in the public press, intimating that any person having knowledge of the locale of a tree four hundred feet in height would receive £20 upon pointing out the same, and an extra amount of £3 for every additional five feet. Following upon this Mr Joseph Harris, MLA a member of the Vegetable Products Committee, obtained through the kindness of Mr S Willis of Prahran, the hollow butt of a tree which had been for convenience of transport sawn into thirteen vertical sections, and which was fitted together and placed in the Exhibition grounds. This butt was fifteen feet in height and was described as follows:-

Species Eucalyptus amygdalina, var. regnans (White Gum). This specimen before being felled measured seventy-two feet in circumference at the base, was four hundred feet in height, and came from the Menzies' Creek, near Ferntree Gully, Dandenong Ranges.

The Government Surveyors also furnished all the information they possessed, and the Honourable James Munro personally offered a reward of £100 to any one who could point out a tree four hundred feet in height. The reports of the surveyors tended to show that the largest trees were to be found in the Otway Ranges, south Gippsland and near Healesville.

As time was pressing, it was considered desirable to divide the work of obtaining the desired photographs, and Mr N.J. Caire, and Mr J Duncan Peirce, of East St. Kilda, were requested to undertake it. After some delay Mr Caire declined to co-operate, and the whole work devolved upon Mr J Duncan Peirce, who in addition to being an excellent photographer was also a civil engineer, and therefore specially fitted to take accurate measurements. He was assisted by Mr C.R. Cunningham, a surveyor of Queen Street Melbourne, whose bush experience was found to be extremely valuable. The trees inspected were carefully measured with theodolite, clinometer, and chain, but in so far as reaching four hundred and fifty and even five hundred feet, *the highest specimen found measured only three hundred and twenty-six feet one inch.*

Table 1. Giant trees of Victoria

TREE No. OR MARK	CIRCUM-FERENCE ft. in.	HEIGHT FROM GROUND ft. in.	HEIGHT OF TREE ft. in.	DISTRICT AND COLONY	GENUS & SPECIES OF TREES
TREES MEASURED BY VARIOUS PERSONS PRIOR TO 1888 IN VICTORIA					
1.	40 0	5 0	300 0	Sassafras Cr. Vic (a felled tree)	Blackbut
2.	52 0	5 0	280 0	Black Spur, Dividing Range	Blackbut
3.	46 0	5 0	302 0	Black Spur	Blackbut
4.	-	-	470 0	Mt Baw Baw	Blackbut
5.	-	-	410 0	South Slope, Yarragon Rg., Gippsland	<i>E.amygdalina</i> <i>var.regnans</i>
6.	-	-	302 0	Two miles N.of Fernshaw (C Walter)	<i>E.amygdalina</i> <i>var.regnans</i>
7.	45 0	-	416 0	Cape Otway Range (C Walter)	"
8.	-	-	480 0	Mr Ferguson	-
9.	69 0	1 0	336 0	Mr Corrawmabool Dandenong	<i>E.amygdalina</i>
TREES MEASURED IN 1889 BY SURVEYOR AT HEAD OF YEA RIVER					
10.	22 6	5 6	297 0	North side of Yea River	<i>E.amygdalina</i> <i>var.regnans</i>
11.	30 0	1 0	268 6	"	"
12.	23 3	6 0	296 6	"	"
13.	32 5	1 0	294 0	"	"
	23 3	6 0	-	"	"
14.	-	-	226 0	Fisher's Creek	"
TREES IN SASSAFRAS GULLY DANDENONG STATE FOREST					
Measured on May 17, 1889, by Messrs Geo S Perrin, RW Fuller and D Boyle					
15.	35 8	6 0	-	Dandenong Street	<i>E.amygdalina</i>
16.	34 0	8 0	267 3	Forest E.Side	<i>E.regnans</i>
17.	32 8	6 0	271 0	of Sassafras Ck.	"
18.	40 6	6 0	-	and on N. Slope	"
19.	41 6	6 0	-	of range running	"
20.	28 6	9 0	248 6	parallel to creek	"
Baron	43 5	6 0	219 9	and from 20 to 160	"
22.	24 10	4 6	-	yards from the stream	"
23.	20 6	5 0	-	"	"
24.	21 10	6 0	253 2	"	"
			243 0		

Table 1 Notes

Tree

1. Dandenong Forest. Measured with careful pacing by Professor WC Kernot.
 2. A healthy specimen and vigorous. Measured with a clinometer and chain by Professor WC Kernot.
 3. Measured with a theodolite and chain by Professor WC Kernot.
 4. Supposed to be *E.amygdalina*. Measured by Professor WC Kernot.
 5. Reported to Baron von Mueller by AW Howitt as being felled and burnt by a selector named T. Rolls and a splitter named Dickenson. Noted in *Eucalyptographic Decade V*.
 6. Felled by a splitter named Hutchinson.
 8. Lockhart Morton, "The Argus", May 25, 1889.
 9. Fallen tree measured by Mr Clemont Hodgkinson (mentioned in a letter in "The Argus", May 26, 1889, by RB Smyth).
 10. Fallen tree measured by Mr RW Fuller, engineer, head works, Melbourne Water Supply.
 11. Fallen tree Mr RW Fuller, engineer, head works, Melbourne Water Supply.
 13. 10,000 palings split from this fallen tree.
 14. Young live tree, half-grown, close to J Bell's garden fence, four miles from Narbethong.
 15. Height not measured about 280 feet estimate.
 18. Height not measured.
 19. Height not measured.
 21. Baron. On the lower side towards the creek the tape was held in position by a stick at 10 feet from the ground.
 22. Height not measured .
 23. Height not measured.
 24. A tree felled and dead; accurately measured.
-

Table 1 was prepared by G.S. Perrin, the Conservator of Forests and describes the 24 large trees known in (1888) with some notes on their origin.

Mueller (1885) in 'Select Extra Tropical Plants' comments further as follows:

The former species or variety, which has been called *Eucalyptus regnans*, represents probably the loftiest tree on the globe. Mr J. Rollo of Yarragon measured a tree, which was 410 feet high. Another tree in the Cape Otway-ranges was found to be 415 feet high and 15 feet in diameter where cut in felling, at a considerable height above the ground Professor Wilson and Colonel Ellery

obtained at Mount Sabine a measurement of 21 feet 8 inches in diameter of a stem where cut, the length being 380 feet.

G W Robinson, a civil engineer, who apparently had frequent contact with the Dandenongs during the second half of the 1800s, in a paper presented to the Field Naturalists Club of Victoria (*Victorian Naturalist*, June 1911) reminisced on conditions of sixty years ago. It is important to remember that these are the memories of long ago by a man who must have been then well into his 80s:

During the early years of this State - say from 1854 to 1862 the period I was best acquainted with the Dandenong Ranges - palings and shingles were in great demand for building and roofing purposes, galvanized iron being at that time almost unknown.

When staying in 1854 at a farm-house about seven or eight miles from the locality known as Emerald, I well remember a paling-splitter coming to the farm and giving an account of some immensely tall trees. I was greatly interested in his story, and wanted there and then to go and see them, but was informed that the place was so inaccessible and remote from any habitation that it would not be safe for me to make the attempt alone. However, three years later I had an opportunity of visiting the spot.

Referring back to my note-book for the measurements made by me at the time on the ground I find that all those measured were over 300 feet in length. The longest that I met with was 342 feet to the commencement of the "die-back" portion of the tree, and as the stem there was from six to seven inches in diameter, I estimated the "die-back" portion to have been from 15 to 25 feet in length, thus giving an approximate length of 360 feet. (Note - there is no record either of the notes or the note-book referred to by Mr Robinson).

As mentioned earlier the name A.D. Hardy appears often in connection with big trees in Victoria. During the period 1918 - 1940 he published several articles in the *Gum Tree*, the *Victorian Naturalist* and other journals. These references are now one of the main sources of information on tall trees. Alfred Douglas Hardy was born on 1 August 1870, a son of John Hardy, then the Government Surveyor for Victoria. He was appointed to the Public Service of Victoria on 1 July 1883, when less than 13 years old. (In those days general education was complete when the Qualifying Certificate was acquired at the end of year six). In the latter part of his career he worked for the Forests Commission, and upon retirement in 1935 was Chief Draughtsman for the Commission. After retirement he continued his life-long interest in Victoria's tall trees. In 1918 he wrote:

Trees of over 300 feet are not plentiful, but while we have unexplored forests in inaccessible places it would be unwise to say that finality has been reached with our present best record.

Although accounts in scientific prints are not necessarily perfect, those of popular journals, *judging by some that we have read, should be accepted with caution. Here are some height figures given at various times, some of which have been referred to without enthusiasm by Mr Maiden:-*

420 feet	Dandenongs	D. Boyle, 1862
420 feet	Blacks' Spur	Reported by H. Heaton as measured by F v M
415 feet	Cape Otway	F v M, "Select Extra-Tropical Plants"
521 feet	D. Boyle	
480 feet	Blacks' Spur	Klein, quoted by F v M, Jour.Bot.
471 feet	Baw Baw	"G.W. Robertson" (F v M in "Extra-Tropical Plants")
500 feet		"W.g.G Robinson (F v M)

The last two probably refer to the same tree, and the name of the surveyor, should be G W Robinson".

Random references occur in many publications particularly in the 1900-1925 period. Owen Jones, Forests Commission Chairman in a lecture to the Melbourne University Science Club in 1921 was reported as follows:

It remained a moot point whether *E.regnans* the Mountain Ash of Victoria was not the tallest tree in the world. Early settlers spoke of specimens 300 to 400 feet high and a giant in the Baw Baws reported to be 470 feet. At the time of the Melbourne Exhibition generous rewards were offered by the State Government and private interests to elicit definite information of trees over 300 feet and the tallest tree then located was 326 feet 1 inch. Subsequently an *E.regnans* was found at Colac measuring 347 feet above ground.

Whether trees over 400 feet ever existed must be regarded as doubtful although the general agreement between the stories of bushmen, cattlemen, surveyors, fossickers, timber splitters etc.

suggests that the search for tall trees, particularly the 1888 one, was some years too late as the tallest had already been felled.

One of the first general warnings against the case for taller trees was by Professor Ewart, Professor of Botany at the University of Melbourne, in his *the Ascent of Water in Trees*, in 1908, and referred to in *Forest Trees for Victorian Foresters*, in which he adds:

The supposed records of 400 feet and over were exaggerations not based on exact measurement Few trees now exceed 200 feet to 250 feet. The maximum heights ranged from 270 feet to 326 feet. A record of 302 feet, due to the late Professor Kernot (CE) was of a tree accurately measured in the Dandenong Ranges, but later destroyed by fire.

In the Royal Society *Transactions*, after discrediting the old account which gave heights ranging from 350 feet up to as much as 500 feet, he stated that 'the tallest Australian tree, therefore, hitherto, accurately measured barely exceeds 300 feet'.

There then seems to be a break in discussions for some years about tall trees and their location until an article appeared in the *Sydney Morning Herald*, written by noted botanist J H Maiden about 1920:

The greatest claims to possess the tallest trees of the world have been made on behalf of Victoria, most of them from Gippsland. In 1862 Mueller wrote to Seemann's Journal of Botany that Mr D. Boyle, of Nunawading near Melbourne, has measured a fallen tree in the recesses of the Dandenong, and found it to be 420 feet. About the same time he wrote to the Australian giving more details about this tree, which was stated to be 392 feet long. He added 30 feet as a fair estimate of the length of the top, which had broken off, and thus we have 420 feet as the height of this tree.

Henniker Heaton states that on the Blacks' Spur were two trees, one, alive, measuring 420 feet in height, and the other (prostrate) 480 feet high. He adds that Baron Mueller is the authority for these measurements. One version, therefore, states that the 420 feet tree is prostrate, and the other that it is alive. If these statements are correct, then two trees of this stupendous height are referred to.

On another occasion, he continues to limit the height to about 400 feet. "In our sheltered springy forest glens attaining not rarely a height of over 400 feet". In 1862, he, in Seemann's Journal of

Botany, stated that Mr E B Heyne measured a tree at the Dandenong 295 feet to first branch, diameter at first branch, 4 feet. To the point where broken off, 70 feet; total, 365 feet. Diameter at fracture, 3 feet, girth of stem 3 feet from the ground, 41 feet. Although not up the 400 feet from the ground, is a very big tree, and I am sorry that we have not evidence which would warrant our accepting it. *In fact, these old records are simply unreliable, in spite of their apparent attention to details.*

We will go a step higher. In 1889, the Hon. F Stanley Dobson, of Melbourne, quoted Mueller as having stated in his "Botanical Teachings", that our gum trees attain a height of 500 feet. I cannot trace this particular reference, but I have other references of such a height to which Mueller gave currency. For example, in Seemann's Journal of Botany, he states that Mr George W Robinson, in the back ranges of Berwick, found a tree 81 feet in girth 4 feet from the ground, and supposes that towards the sources of the Yarra and Latrobe Rivers it attains 500 feet.

Another contemporary account says that Mr WG Robinson, of Berwick, Victoria, in a journey from Gippsland to Mount Baw Baw, saw and measured a tree 500 feet high. Later on, in an edition of the "Select Extra Tropical Plants", the name of the finder and the height are varied. "Mr GW Robertson, surveyor, measured a tree at the foot of Mount Baw Baw 471 feet high".

But we have not reached high-water mark yet. Mr David Boyle, who for twenty-seven years had been identified with big trees, in 1889 wrote to the Melbourne Argus, giving 525 feet as the height of a tree known to him some years previously. As this was considered to be rather "tall", and is, I believe, the greatest height in or out of Australia claimed for a tree, Mr Boyle replied to inquiries; "I determined to have it photographed and measured, ten years having elapsed since I measured it before ... I found it. The tree was healthy, the only change in it since I saw it last being that a portion of the top was blown away. The measurement now is 466 feet high, and its circumference 4 feet from the ground, 81 feet; base, 114 feet.

An Inspector of Forests and a Government surveyor subsequently measured this tree accurately, and found it to be 219 feet 9 inches. Here was a come-down. "No tree in the neighbourhood reached 300 feet". *The tree, of which a specific measurement was given, was found on actual measurement, to be less than half its reputed*

height. The Hon. James Munro, Premier of Victoria, thereupon offered a reward of £100 out of his own pocket for any Victorian tree 400 feet in height, *and the reward has remained unclaimed to this day.*

It turned out that Mr Boyle's tree and Mr Caire's tree were identical, so that the 525 feet tree shrank over 300 feet. The public interest aroused at the time brought a crop of other guesses and measurements.

Mr Stanley Dobson, who spent much time trying to get at the truth in regard to these trees, writing to the Royal Society of Tasmania, "believed" that the highest found by a Government surveyor was near Neerim, in Gippsland, and was 325 feet. Even this was excessive, as the Sydney Morning Herald of January 21, 1889, gives the height as "227 feet with the top broken off, and a girth 6 feet from the ground of 55 feet 7 inches". Another tree on the Blacks' Spur, at Fernshaw, had a height of 237 feet 6 inches, the top being broken off, the girth 6 feet from the ground being 50 feet. A still loftier tree was reported, that on Mount Monda, with a height of 307 feet, and a girth 6 feet from the ground of 22 feet 8 inches. The height given of a tree on Mount Baw Baw is 326 feet 1 inch, with a girth 6 feet from the ground of 25 feet 7 inches.

I am sorry I am unable to quote the authorities for these figures, and therefore my readers may take them for what they are worth. They were given a few months before the "shrinkage" of the height of the Baron, and before the challenge to have all heights verified by a surveyor.

This is a revealing summary of the situation as reported in 1920 by a well known and highly respected botanist.

Measurements of many individual trees occur in the records. Some can be accepted as reliable but others are sometimes little short of speculation. Records of the trees which follow are from AD Hardy's notes and all are *Eucalyptus regnans* unless otherwise indicated. His report about the Cambarville Sample Acre in the Cumberland Valley states:

So long ago as 1896, Mr D Ingle, then a local forester (later one of the Forests Commissioners of Victoria), repeatedly referred to the tall forest in the Cumberland Valley, easterly from Mt Arnold. Trees in that forest, he claimed, were well over 300 feet. So to him may be credited the finding of one just exceeding that, since

one in his tall forest is the Cumberland Tree, 301½ feet, accurately measured. That in preparation for the visit of the British Empire Forestry Conference in 1928, the Forests Commission of Victoria cleared the dense undergrowth of Pomaderris, Tree-ferns, Senecio, Hedycarya, Olearia, etc, from an acre, which the Commission has labelled "Sample Acre". The measurements made by Mr Ferguson, of the Commission's service, gave the following results:- Total number of trees 27. Height measured with Abney level (clinometer), average of 266 feet, tallest of the group, 293 feet. Girth at 10 feet; average 13.5 feet; largest girth, 17 feet 4 inches. A mean of more measurements might have increased Mr Ferguson's average. My own mean, using two Abney levels, was 303 feet. Subsequent theodolite measurement by Mr Mervyn S Bill, Forests Surveyor, being 301½ feet. The girth of this tallest Australian tree is 20½ feet at above 5 feet 6 inches and about 17 feet at 10 feet from the ground.

Measurements made in 1955 of the seven tallest trees in the Cumberland "Sample Acre", (Forests Commission Records) are:-

<u>Height</u> (Feet Inches)	<u>Girth at 10 feet</u> (Feet Inches)
285	14
283	16 6
301 6	16 5
285	13 6
295	13 6
279	16
271	13 9
283	22 7

In 1947 the heights of the 27 trees on the plot ranged from a minimum of 232 feet to a maximum of 301 feet 6 inches. The plots have suffered severe storm damage on at least two occasions in the last twenty or so years so some of these trees have been reduced in height. Hardy also mentioned at various times individual mountain ash trees including the Thorpdale tree, claimed to have been 375 feet tall, the Baw Baw tree (326 feet and 1 inch), the Olangolah tree (329 feet), the Dandenong Ranges trees, including the Baron (219 feet), Neerim Township Reserve tree (227 feet), the Mueller Tree (287 feet) sometimes known as the Farnston tree, Uncle Sam and Big Ben, the Tooranga Plateau Tree, the Gembrook Tree and the Tanjil Oven Tree (*E.nitens*).

Conversion factors

1 foot = 0.3048 metre; 1 inch = 0.0254 metre.

Regional and Environmental Studies



CHAPTER 3

CULTURAL SIGNIFICANCE OF EAST GIPPSLAND FORESTS

Anita Brady

The Department of Conservation and Natural Resources in Victoria recently completed a survey of old growth forests in East Gippsland (Ritman et al. 1992). Part of the project was to compile a history of 150 years of human-induced disturbance in the forests, together with a set of related databases. The historical information gathered during the survey is now being applied to the assessment of national estate values in the region (as per an agreement between the Department and the Australian Heritage Commission in February 1991). The Register of the National Estate is concerned with cultural as well as natural significance. The paper represents an attempt to define the cultural values of a forested region, which is otherwise celebrated for its high natural and environmental qualities and is chiefly concerned with European cultural places, or those representative of the past 150 years in East Gippsland.

For a proven and widely accepted definition of cultural significance, heritage professionals frequently reach for the Burra Charter. Since its adoption in 1979, the Charter's principles have been well tested on the built, or man-made environment. An early emphasis on the architecturally outstanding or extraordinary structures of our past, has given way to increased recognition of those buildings, relics and places that reflect a greater range of historic themes in Australia. But for the essentially natural environment, we have only recently begun to define our cultural values. As Ken Taylor found when he considered what might be culturally significant in the Australian Alps: 'The problem ... is not what to talk about, but how to precis the subject and specifically where to begin?' (Taylor 1992:55).

The natural environment is not easily divested of its cultural imprints. The history of our interaction with nature is diverse and changing, and a case for cultural significance can be made for many aspects of human endeavour. It can be found in our efforts to exploit and extract natural resources, to win control over inhospitable country, to admire and protect wild places. Moreover, the cultural values of forests are represented not only by those relics and sites that

remain or which can be identified, but also in the less tangible manifestation of our attitudes to, and experiences in forested environments.

Background

The Department of Conservation and Natural Resources (CNR) is responsible for more than one million hectares of public land in East Gippsland, much of which it has designated the 'East Gippsland Forest Management Area'. In recent years the Department has made studies of flora and fauna, water catchments and timber production in forests of the region. A growing number and variety of 'natural' databases have been compiled for the Department's Geographic Information Systems (GIS) which contain information on forest ecology, vegetation and floristic communities, hydrology and stream systems.

The Department recently supported a study of old growth forests in East Gippsland, with an environmental history component. This approach attempted to redress the inadequate representation of history in departmental databases. Research was focused on the human history of the forests, specifically on human-induced disturbances of the forest environment such as mining, logging, grazing and early agricultural clearing. Historical data contained in archival records of the former Victorian Departments of Crown Lands and Survey, Minerals and Energy, and Forests Commission was systematically extracted and built up into thematic layers of geographically-based information.

Most 'cultural' surveys of forested regions in Australia have been driven by the need to identify and record sites. This reflects not only our desire to document the relics and remains of human endeavour in natural environments, but also a growing awareness that both the natural and cultural resources of forests are finite. As timber extraction techniques improve, the rich heritage of forests is increasingly threatened (McConnell 1988). All too often cultural resource managers are but one step ahead of logging activity in forest coupes, struggling to document and record historic sites before they are destroyed.

The East Gippsland survey however was archives-based, or even archives-driven, to meet the thematic data collection requirements of the old growth study. This gave the East Gippsland project a different emphasis to those surveys which are chiefly concerned with the identification and recording of sites. We now have a broad overview of the land-use history of the region and identified patterns and trends in the occupation of the forests. The data-sets provide a sound historical basis in which to assess cultural significance and perhaps even a unique perspective on what might be significant.

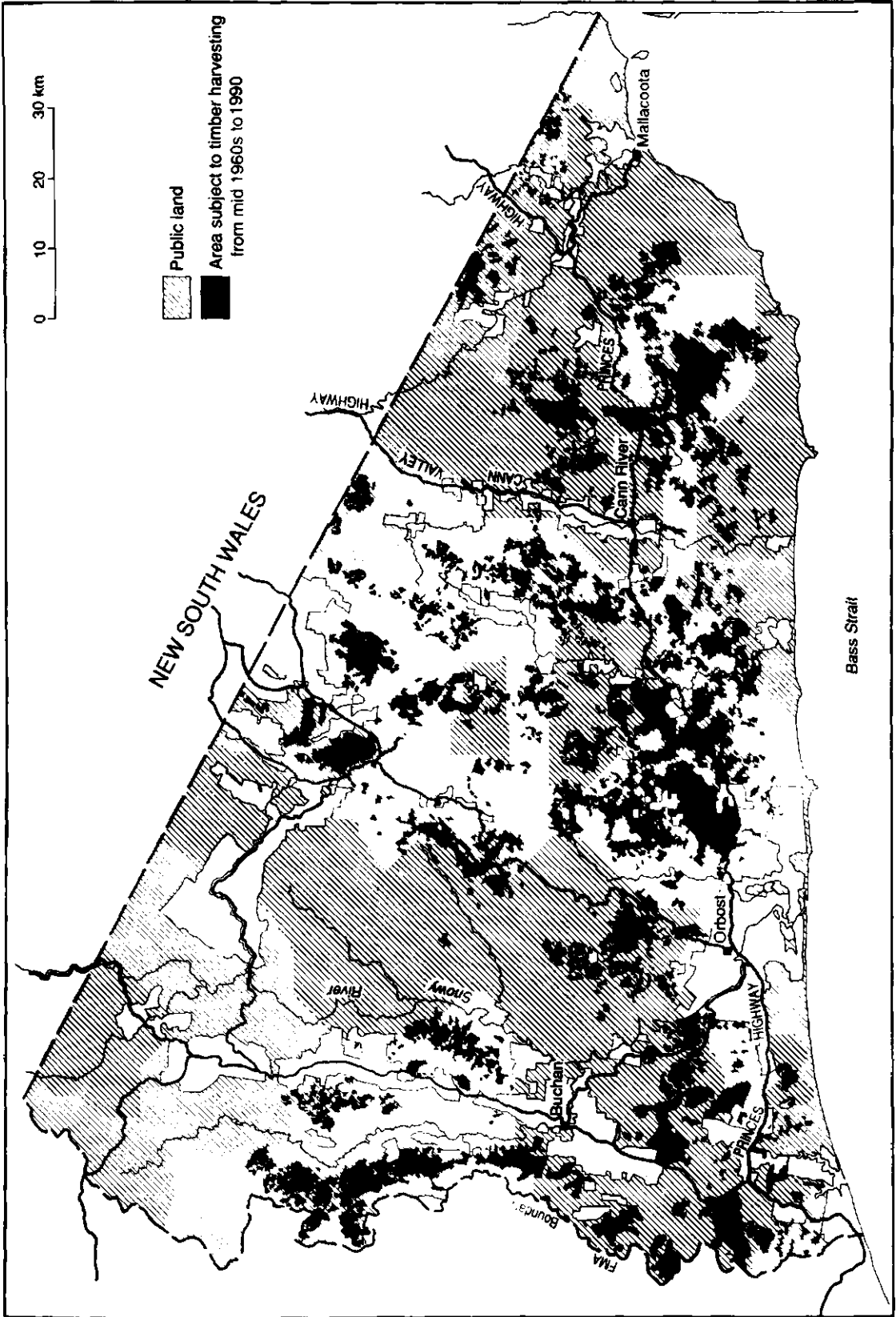


Figure 1: East Gippsland Forest Management Area

Environment

East Gippsland occupies the predominantly mountainous and thickly forested south-eastern corner of the Australian continent. Rivers cross the region from north to south, and wind down to Bass Strait through the deeply dissected Great Dividing Range and lowland plains and foothills. The Mediterranean-style climate of southern Australia, together with the sub-tropical conditions of east coast New South Wales, bring mild winters, temperate summers and high rainfall to the region. Overlapping biogeographic zones, from coastal eastern Australia, including southern Victoria and Tasmania, result in an unusual blend of flora and fauna with many species in East Gippsland existing at the outer limits of their natural range. Though the region occupies only four per cent of the land area of Victoria, it has 45 percent of the State's native plant species, 60 percent of native terrestrial mammal species, 40 percent of birds, 21 percent of reptiles and 60 percent of amphibians (CFL 1985).

In the north-east rain shadow, snow gum, montane sclerophyll woodlands and riparian forest are dominant, with mixed dry and wet sclerophyll forests covering the large 'middle' zone below the sub-alpine districts and above the coastal woodlands and river plains. Mountain ash, messmate, blue gum, shining gum and brown barrel, or 'cut-tail', are found in the wet sclerophyll forests of the middle zone. The south of the region is distinguished by lowland sclerophyll forest, which is the most extensive vegetation type on public land. White and yellow stringybark, messmate, mountain grey gum, yertchuk and silvertop ash are found in lowland sclerophyll communities. Pockets of banksia and coastal heathland are also located in the south of the region (Forbes et al. 1981, and Parkes et al. 1985).

More than 80 percent of East Gippsland is public land, with 30 percent located within National Parks and other reserves. The remaining 50 percent is State forest, which is managed and conserved for a range of uses including hardwood production, water, landscape values, historic sites, Aboriginal sites and natural conservation areas. The forests of East Gippsland, like those elsewhere in Victoria including the Otways, Central Highlands and South Gippsland, are remnants of the great expanse of forests and woodlands which once covered nearly 90 per cent of the State (Woodgate and Black 1988).

Many current forest stands, cut down and destroyed in earlier and less aware times, have been nurtured and encouraged back by forest managers. In other places forests have returned after a period of clearing or exploitation, perhaps through local indifference or neglect. In this sense they are cultural artefacts in their own right. Rare patches of forest may even predate the onslaught of land settlement and natural resource exploitation in Victoria, if they were in non-auriferous or recognised poor agricultural country, or set aside in early recognition of the need to protect their high natural or water catchment values.

Cultural places in forests

The Burra Charter defines cultural significance as having aesthetic, historic, scientific or social value for past, present or future generations. Cultural significance can '...help in identifying and assessing the attributes which make a place of value to us and to our society' (Kerr 1990:3), or as put by the Heritage Commission:

Historic sites provide evidence of changing demography, ethnic diversity, economy and landuse, political structures, social organisation and intellectual or aesthetic developments ... Historic sites also contribute to an understanding of the pattern of settlement in Australia ... providing insights into aspects of Australian history together with technological, architectural and other cultural information, that may otherwise be lost. (AHC 1990b:8)

It is self evident that the range of places in forests very much reflects the nature of our activity there. In Victoria much of this history is tied up with the history of forest management and land utilisation. Most forests have traditionally been in public ownership, and we have gained or been denied access to them and their resources through the complex bureaucratic processes of leases and licences, the sale or alienation of Crown lands, and the reservation or protection of special or resource-rich areas.

Cultural sites exist within forests because of the trees and timber products, the minerals and water, and the native flora, fauna and scenery. Sawmills, timber transportation networks, sleeper cutting areas, mining and quarry sites, hydro power stations and dams, fire towers, charcoal pits, tourist facilities, lookouts and scientific research sites reflect our attraction to the forest resources. Other places are incidental to the environment, or exist because the forest formed a natural barrier through which people had to pass. Rail and road routes, bridges and cuttings, and stopovers are some of these places. Still more sites reflect the use of forests as marginal agricultural land, the focus of well-intentioned but misguided land managers. Typically these sites include the remains of temporary settlement or abandoned farms, salt licks, orchards, dairies, and cleared and ringbarked areas (AHC 1992). Cultural places can also reveal the environmental effects of forest based activities, and demonstrate past mistakes and achievements. Abandoned farms remind us of doomed attempts at an often inappropriate land use. Huge sawdust heaps in healthy regrowth stands point to extensive timber exploitation in the past. Rusty boilers, engines, water wheels and elaborate race systems, left behind and sometimes intact after mineral extraction ceased, emphasize the capital costs of mining and the additional expense of moving machinery out of remote forest areas.

The forests of East Gippsland

During a century and a half of European occupation, the forests of East Gippsland have been explored, grazed, logged, ringbarked, fossicked and dug over for gold and other minerals, cleared for cultivation and pasture, and regularly set fire to. The search for grazing runs began in the 1830s, and gold prospecting and botanical exploration followed in the 1850s. Agricultural settlement of the forests was underway before the turn of the century. Local hardwoods, including red ironbark, red box, southern mahogany and the famous Gippsland grey box, soon won recognition for construction and engineering purposes. Sleeper hewers regularly found employment in the lowland forests, and mining interests were drawn to the silver and copper deposits. Settlements grew up in association with these activities and sometimes disappeared, when the gold ran out or the crops failed to pay or the struggle against the returning forest was lost. Some mining relics remain, huts and fences have decayed, forest clearings have quickly reverted to bracken and scrub. Log and sleeper landings are grown over, and splitters' camps have disappeared.

Freehold land in East Gippsland was hard-won. Human incursions into the forests over the last 150 years, both short-lived and permanent, have made only a moderate impact. Small farming and timber communities cling to their isolated clearings within the forests, joined by a network of roads through the overwhelmingly green landscape. The region failed to become more closely settled because of the historical problems of distance from urban centres and markets, difficult access and lack of roads, and the tenacious return of the forest vegetation. Settlement is now thinly spread along the river flats and valleys, at points on major and minor transport routes, and at river crossings.

Very few of East Gippsland's individual historic sites stand out in terms of excellence, innovation or rarity. It is the connections, or patterns, which matter in this region, adding up to form networks of sites in the forests which, when viewed in their totality, have cultural significance. 'Associational links' between places and to important, identified themes, usually require long-term investigation and documentation (Kerr 1990:10). This has mostly been achieved for East Gippsland, through archival research on a 'micro' level and the accumulation of data according to important historical themes.

Early Europeans

Sailors, explorers and graziers were among the first Europeans in East Gippsland, and their interchanging roles are a feature of the history of this region. Captain Stevenson was a whaler operating in the seas off south-eastern Australia in the early nineteenth century. He eventually settled in the Mallacoota district in the 1840s, establishing one of the first pastoral stations in Victoria. Angus McMillan was a grazier who was also an overlander and explorer of the

hinterland. Shipwrecked sailors became unwitting explorers of the coast, while struggling back to civilisation.

Cape Everard was the first Australian landfall sighted by James Cook on his voyage of discovery in 1770. This must surely rank it as a place of high cultural significance for European Australians. Other sailors in the region, on official business of the British Admiralty, included Mathew Flinders in 1801-2 and Commander J.L. Stokes in 1841. Charts were required for the East Gippsland coastline, which eventually became one of Australia's busiest sailing routes as ships plied the waters between the colonies of New South Wales, Van Diemen's Land and Port Phillip. The survivors of the wreck of the Sydney Cove in the Furneaux group of islands, were washed up on the shore in 1797 and walked back along the coast to Sydney, with only three surviving this journey. Their descriptions of the straits off East Gippsland, and the local seal populations, brought a vital early industry to the East Gippsland waters and official explorers, such as George Bass. For sealers and whalers of this period, protected bays and islands along the coast may have provided shelter and water, or bases from which to exploit the local maritime resources. Several likely bases are located between Point Hicks and Cape Howe, including Gabo and Tullaberga islands (Thompson 1985:17).

Few explorers pushed into East Gippsland for altruistic reasons. They were more likely motivated by financial gain or career enhancement. The search for grazing country, gold and minerals, and even rare or unusual plants, eventually sent people out into the far corners of the region. Among the first were the grazier/explorers, most of whom skirted around the great mass of East Gippsland forests. They clung to the fringes, coming down the coast from south-eastern New South Wales and along to the mouth of the Snowy River or Gippsland Lakes; or they came over the mountain ranges in the north-west of the region, their easterly views from the Alps revealing a huge extent of green and seemingly impenetrable forests. Count Paul Strzelecki named Gippsland after Sir George Gipps, then Governor General of New South Wales, while on an exploratory journey in 1840. The Count ventured only as far east as the Tambo River and Omeo. Angus McMillan won the title of 'discoverer' of East Gippsland because of his travels through the region in 1839-41, while searching for grazing country. McMillan worked his way through the mountains in the north, crossed the Snowy and Tambo rivers, and explored the country around Omeo and Ensay through to the Gippsland Lakes and eventually on to Port Albert.

Other early Europeans very likely preceded the recognised explorers into East Gippsland. Cattlemen from the increasingly crowded Monaro Plains of southern New South Wales were driven southwards in the mid-1830s by a run of dry seasons. They followed the natural routes into East Gippsland, along the valleys and water courses and across the mountain ridges. After laying claim to the

fertile plains, they later returned with their cattle to what effectively became a regional outpost of the Monaro pastoral industry. George McKillop in 1835, Andrew Hutton and Edward Bayliss in 1838, and Thomas Moore in 1839 were among these first graziers.

The natural diversity of the region quickly attracted another kind of explorer. Ferdinand Mueller, of the Melbourne Botanic Gardens, began the tradition of botanist/explorer by undertaking several journeys in East Gippsland in the 1850s, and again in 1860. During these botanical expeditions Mueller explored the valleys of the Tambo and Buchan rivers, roamed over the coastal plains between Lake King and Cabbage Tree Creek, climbed the Cobberas and Nungatta ranges and travelled down from Eden to the Genoa River and Cape Howe (Gillbank 1991). He was later followed by Alfred Howitt and Walter Baldwin-Spencer, and in our own century by Norman Wakefield.

Boundaries and borders

East Gippsland is equally remote from the urban centres of Melbourne and Sydney. During the 1830s and 1840s the roving cattlemen of the region looked northwards to the Monaro Plains for their instructions and wages. In the 1850s when the colonies separated, and East Gippsland was officially attached to Victoria, the newly established border still counted for little in the local fledgling communities. Its location on the ground was open to interpretation. Cape Howe in the east was 'very indefinite' for at least two miles, while the source of the Murray in the west was an assortment of minor creeks and tributaries (Treloar 1984:8). Settlers in the far north of East Gippsland were sometimes in doubt as to which colony they resided in, and problems relating to Crown land rents and postal services were common.

The ruler straight border across the 'top end' of East Gippsland was not set down until the early 1870s, by surveyors representing the two governments. The border followed no natural boundary but effectively dissected the great mass of south-eastern Australian forests. It introduced an arbitrary administrative division that today, in places, can be seen from space. Cleared farming land in southern New South Wales comes right down to the top edge of East Gippsland, while on the Victorian side the forests have largely been left alone. This contrasting landscape feature is stark evidence, if such is required, of the omnipresent nature of the Monaro pastoral industry. Border cairns and trig stations can be found at regular intervals along the straight line, in some of Australia's most rugged and inaccessible locations.

The western boundary of East Gippsland varied from time to time, with no inter-colonial dispute nor coastline to fix it. The Snowy River may be regarded as a natural barrier, but more likely western borders include the Mitchell River at Bairnsdale, the Omeo Highway (Parkes et al. 1985), or the 148 degrees E

meridian (Forbes et al. 1981). The East Gippsland Forest Management Area of the Department of Conservation and Natural Resources defines the western margin by the Timbarra River, Nunniong Plateau and the Great Dividing Range east of Limestone Creek (Ritman et al. 1992:2).

Settlement

Early pastoral stations at Tubbut, Suggan Buggan, Buchan and Wulgulmerang in the north and west of the region; and at Wangarabell, Genoa, Maramingo and Mallacoota in the east, were sites of some of the first European settlement in Victoria. The archival history of the grazing industry, in all its various categories and forms of administration, underlines the enduring nature of pastoral land-use in East Gippsland. One hundred and fifty years of forest grazing has generated countless licences, leases and administrative records, and a strong and continuing tradition of depasturing stock on Crown lands. Runs were frequently held by the same family for generations, and the traditions of 'bush cattle grazing' passed down over the years. Leases in the northern reaches of the Cann River, for example, were in such rough and inaccessible country that only those graziers schooled in the customs and vagaries of the terrain were successful (Thompson 1952:9).

The relics and remains of this historic forest use can be found in the broken stockyards and pens, in the fences, huts and outbuildings. Less immediately obvious are the tracks carved through the forests, along which stock were driven to markets and herded in 'night paddocks' en route. The Ingeegoodbee Track was an important historic stock route between north-eastern Victoria and the Monaro district. The track went north from Suggan Buggan, over the 4000 feet high range near the border and on to Jacob's River and Jindabyne in New South Wales. It was still being used by Monaro stockmen well into this century, bringing cattle down to the market at Bairnsdale, and only fell into disuse after the opening of the Buchan-Jindabyne Road in the early 1960s (Stephenson 1980:54-56).

The oral traditions of grazing are also very strong. Good horsemanship and bush-skills are lauded, along with the knowledge acquired over generations of running forest leases. The cultural significance of long-term grazing leaseholds is therefore found not only in the tangible remains of buildings and other forest infrastructure, but in the stories and the folklore. The Sellers family of Lower Bendoc for many years held a grazing lease which covered Mt Delegate. Jack Mustard, in his published memoirs, recounts how the mountain presented no problem to the Sellers brothers. They merely circled the hill with a cattle-proof fence, put in a gate at the bottom, and easily mustered their stock in autumn when the time came to bring the animals down for winter (Thomas 1991:121).

Archival research has also revealed the network of abandoned farms in some

forests of the region. These sites, like those of other marginal agricultural country in forested areas of Victoria, are the legacy of late nineteenth century land settlement legislation. Through an array of Land Acts and amendments, various Victorian governments strove to transform the unoccupied Crown lands of the State into productive agricultural districts. The attempts to settle the more remote, mountainous and thickly forested areas, such as East Gippsland, which began in the 1880s and continued into the present century, ultimately failed. The sources of failure were inexperience, lack of capital, inadequate size of holdings, and the inability of governments to provide even basic roads in some areas.

The reminders of settlement can sometimes be found in the layout of farms and ringbarked paddocks, and in the broken fencelines and neglected fruit trees. In forests '...the first signature of private ownership was a clearing' (Griffiths 1992:16). It was also one of the first cultural imprints on a natural area, along with fencing - both conditions to be met on all Crown land selections. The will to 'improve' natural areas, to tame forest environments and make them more 'productive' by introducing agriculture, led to the rise of a veritable industry in forest clearance. Ringbarking (or 'ringing') proved the most enduring method and Australians may have cleared between 24 and 40 million hectares of woodlands and forests in this manner (Williams 1988:122). To ringbark a thickly forested block sometimes took more than one generation of back-breaking work. Fertile river flats returned the greatest reward for the effort of clearing, with the creation of good pasture or flat areas ready for cultivation. The same treatment of hillsides however denuded them of vegetation and very often caused soil erosion.

In Victoria, Crown land allotments taken up in the historic period and later reverted to the Crown, are supported by numerous extant correspondence files - the result of meticulous record keeping by Lands Department bureaucrats. Many of these allotments now fall within National Parks and State forests. These archival records have enabled us to identify the locations of the failed farms and settlements. They have also added to our knowledge of this phase in our land settlement history. The stories of those who lived, worked and sometimes died on these struggling farms make poignant comparison with the mostly reforested sites of their early endeavours.

Fire

East Gippsland is a fire prone region in a fire prone State. Lightning strikes, graziers' fires, careless tourists and out-of-control fuel reduction burns have all taken their toll on the natural environment. Extensive tracts of forest are still relatively inaccessible and unbroken, litter accumulates on the forest floor, and small outbreaks can quickly build to disastrous fires in extreme summer conditions.

In a cultural context fire has many faces in East Gippsland. Though wildfire is a menace and a threat to life and property, local settlers have traditionally used fire as a tool in land management. D.M. Thompson was the District Forester at Cann River in the 1940s. He observed a 'tradition of fire' among local people, handed down over three or four generations (Thompson 1952). 'Cattlemens' burns', on freehold and leased Crown land, were common in the region for more than a century. Graziers set fire to the bush to encourage the growth of the 'green pick' preferred by wandering cattle, and to maintain access through the dense undergrowth. Restrictions on fire lighting after 1939 have made an impact on forest structure. In the Errinundra district constraints on deliberate burning resulted in a build up of forest bracken and thickening undergrowth, and increasingly difficult passage through forests (Griffin 1962).

Official vigilance in regard to fires has seen the development of a network of roads, fire-spotting towers, water storage dams and radio communication points throughout the forests. The Victorian Forests Commission invested a great deal of time and money over many years in educating local people about the need to modify their burning habits. Despite these efforts, and the introduction of more severe penalties and restrictions in the post-1939 period, deliberate fires were still being started on forest leaseholds in East Gippsland in the last decade. Anthropogenic fire is a major factor in cultural impacts on forests of the region.

Mining

Gold fever broke out in East Gippsland at Bendoc in the 1850s and flared again in later decades, when prospectors found alluvial flecks at the heads of many river and stream systems throughout the region. Most fields proved to be relatively shortlived and unproductive though good returns were had from quartz reefs at Bendoc, Bonang, Club Terrace and Clarkeville. The latter settlement was one of the many temporary gold mining communities of nineteenth century Victoria, that briefly burst into life in auriferous areas within forests. Clarkeville prospered, even bustled for a time, with stores, a school and a hotel; then the community dispersed and the settlement disappeared when the gold ran out after less than ten years. Today it is difficult to find any traces of Clarkeville.

Gold mining left relatively few of its signature scars on the East Gippsland landscape. This environmentally destructive industry, which decimated the forests of Central Victoria, appears not to have had the same extensive impact in East Gippsland. Historic records indicate that mining related forest clearance tended to be localised in the region, where mines were generally short lived. Several townships, including Club Terrace and Cabbage Tree Creek, began life as gold mining settlements but were eventually transformed into conversion centres for the expanding East Gippsland timber industry after the Second World War.

Forest resources and forest management

Trees have been cut down and their timber used for fuel and building purposes since the first graziers moved across the East Gippsland landscape in the middle of last century. The coastal forests were a source of durable construction timbers for Melbourne engineering works from the 1880s. As the railway spread eastwards in the late nineteenth century, greater areas of East Gippsland's forests were opened up to exploitation.

Victoria's hardwood sawmilling industry moved into East Gippsland after the decimation of the ash forests of the Central Highlands in 1939. Before that time timber extraction in the region was not systematic and generally restricted to accessible forests near roads and settlements. Hence there are few early twentieth century sawmill sites to compare with the outstanding timber transportation networks of Victoria's central and south-western forests. But this is not to undermine the significance of other forms of timber extraction which have left less recognisable remains in the East Gippsland environment.

Railway sleepers have been hewn and taken out of the lower middle and coastal forests of the region from the last decades of the nineteenth century. Until relatively recently sleeper hewers worked independently in the bush, felling box and ironbark trees and, after these became scarce, moving on to the stringybark species and later again to mountain grey gum and blue gum. Hewers dragged their timbers to sleeper landings from where they were carted to the 'passer' at railway stations. There is little evidence remaining in forests to indicate the past presence of this industry. Yet it was so widespread and enduring that the removal of suitable trees over the last 100 or so years is likely to have severely altered the ratio of these species within the local forest structure. In the 1920s and 1930s Forests Commission records indicate that sleeper trees were completely 'cut out' in some areas of East Gippsland. Wattlebarking, that great standby of impecunious selectors from Bairnsdale through to Mallacoota, has also left a minimal cultural imprint on the forests unless we recognise that countless young wattles were stripped and left to die over many summers in East Gippsland.

Public land/protected land

Agriculture has largely failed to make a lasting impression on the East Gippsland landscape, resulting in a legacy of huge tracts of essentially natural public land. In the course of this century growing recognition of the need to protect and retain some areas of outstanding natural significance has seen the expansion of the national parks system. Some of Victoria's first parks are located in East Gippsland, including turn-of-the-century Alfred and Lind National Parks, as well as the former Mallacoota Inlet Park, reserved in 1909.

State forests and National Parks are the cultural manifestation of current attitudes to forested public land. In other times natural areas of Crown land were classified as timber reserves, unoccupied Crown land, protected forest, game reserves and so on. Vast expanses of publicly owned Victoria waited upon the decisions of bureaucrats within the former Department of Crown Lands and Survey, before being set aside for selection or sale ('alienation'), or withheld for a variety of public purposes.

Today, in the wake of the 1986 recommendations of the Land Conservation Council, more than one quarter of East Gippsland is designated National Park. Increased acceptance of the need to protect and conserve natural areas has been a cultural process, 'an expression of the relationship between Western man and nature' (Bardwell 1974:xii). The reservation of suitable public land in East Gippsland represents our attempts to reconcile non-economic uses of natural areas with a growing conservation ethos. State, regional and coastal parks together with scenic or wildlife reserves account for another four percent of the region (LCC 1986:2).

The Register of the National Estate lists some 25 areas in the region, including the Croajingolong, Snowy River and Cobberas-Tingaringy National Parks, the Errinundra, Rodger River and Coopracambra areas, several rainforest and wilderness zones, and a variety of coastal and riverine environments. Some cultural places, significant for their pre-historic and Aboriginal values, are also listed, notably the Buchan and New Guinea cave areas, shell midden complexes at Mallacoota and the Wroxham grinding grooves. Lake Tyers Aboriginal Mission, lightstations at Point Hicks and Gabo Island, a significant railway trestle bridge at Nowa Nowa, and the former RAAF operations area at Mallacoota are listed for their historical values (AHC 1991).

Conclusion

This paper has described some of the principle themes in the history of the forests of East Gippsland, and has attempted to outline how these themes are represented in significant sites and places. There is very much more that is 'cultural' that has not been described here. Silvicultural treatment of forests, for example, has left its own cultural imprint on the East Gippsland environment, since at least the early decades of this century. In recent times a new level of significance has been added to the forests, with the increasing focus of the 'Greens', or environmental movement. The protracted struggle of the 1980s to save rainforests of the region has resulted in an education centre in Orbost, several guided rainforest walks, and the naming of 'Blockade Track' in the Errinundra National Park.

The heritage of these forests is therefore found not only in the relics and physical remains of human occupation and activity, but in the stories and hopes and

attitudes of those who moved into and through these sometimes inhospitable environments. The relics are one aspect of our time in the forests - they are also what we left behind. The documentation of our reasons for being there is a whole other story. Cultural significance encompasses all this and more.

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CHAPTER 4

SECRETS OF THE FOREST: WRITING ENVIRONMENTAL HISTORY

Tom Griffiths

Black Friday was Friday the 13th. It was Friday the 13th of January, 1939. I knew 1939 as the year of the great fire well before I knew it as the beginning of the Second World War.

In January 1939, 1.4 million hectares of Victoria burned, whole settlements were incinerated, and seventy-one people died. Most of Victoria's mountain forests were destroyed. In the environmental history of European Victoria, there is perhaps no more significant date.

There was a long hot summer followed by a dry winter. During 1938, rainfall across Victoria was well down and rivers and creeks were at their lowest levels in 80 years. In the forests, the eucalypts dumped their leaves and bark in massive quantities. The ground crunched ominously beneath the boots of bush workers. Temperatures persistently reached 100 degrees Fahrenheit. In early January, a ridge of high pressure built up in central Australia that drove hot northerlies down across Victoria. Hundreds of little fires that had been smouldering and burning for weeks were given new and furious life. They surged together into a giant conflagration (Noble 1973, Stretton 1939).

In 1939, Australia's forests were homes to thousands of workers. Sawmills were established deep in the bush, because it was easier to transport sawn timber than it was to cart huge logs. These sawmills were also settlements, homes for men, women and children, and some of the residents escaped the forest only at Christmas.

In a eucalyptus forest on a hot summer day, with the bush tinder dry, a vicious northerly whipping the tree tops, and the smell of flames in the air, there was only one way to go - and that was down. Dugouts should have been provided at sawmills. These were holes in the ground or in the side of embankments, supported with corrugated iron sheeting and timber props heaped over with earth. All too often, no dugouts were provided for workers and their families at

sawmills. They were the sawmiller's responsibility. They were to be built and stocked at the sawmiller's expense. Many didn't bother.

So when the fire bore down upon them, timberworkers buried their belongings and tried to bury themselves. Some made makeshift dugouts which became death-traps. Some burrowed into sawdust heaps and made themselves an awful, suffocating tomb. Some jumped into water tanks and were boiled. The few who did survive without well-equipped dugouts were near big, broad creeks in which they could immerse themselves. Or else they were able to find a large cleared area, in the centre of which they lay down, wrapped themselves in wet blankets and kept their nerve. When the survivors tried to walk out to civilisation after the fire had passed, they found themselves lost. It was a different landscape. All familiar things had gone. The matchstick trees were no guide to where they were.

It is hard to write fire history without being melodramatic, without dwelling on fire as a tragedy. I have just written a history of the mountain forests north and east of Melbourne, forests that were ravaged by Black Friday (Griffiths 1992). My work was undertaken with the Historic Places Branch of the Department of Conservation and Environment and also with the Monash Public History Group, and began as a commissioned report to the Land Conservation Council on the cultural values of these forests. They are Melbourne's day-trip forests - the forests of Mt Disappointment, Healesville, Marysville, Warburton, Powelltown, Gembrook, Noojee. They are forests of mainly mountain ash (*Eucalyptus regnans*) that were reduced to burnt ash in the 1939 fires. But fire creates as well as destroys, and the forest we know today is largely one to which Black Friday gave birth.

I am going to use Black Friday, and my attempts to write about it, as a way of reflecting upon the practice of forest history. My first draft of the history of these forests was a story of settlement, it was a story of what humans did to the forest. It told of how people had perceived, lived in and used the forests. It offered a history of farming, mining, sawmilling, tourism, and water and forest conservation. It recounted a human history of fire. It imagined all the drama and horror of Black Friday. It recognised Black Friday as a European creation, an awful consequence of a century of white settlement and environmental practice. That was indeed the finding of the Royal Commission into the 1939 fires. 'These fires', thundered Judge Stretton, 'were lit by the hand of man' (Stretton 1939:5). It was society and not nature that was under trial at the Royal Commission, and so too in my history. The forest remained the backdrop to my story, a picturesque setting, a valued resource, something that was exploited, used, protected and acted upon, but which was rarely allowed a dynamic of its own.

That is the way in which historians usually include the natural world in their narratives, by making it into an artefact, by drawing it within the sphere of human influence and diminishing its natural dimensions. Hence we often talk of 'impact' or 'land-use' or 'conquest', words that describe a one-way relationship. 'Environmental history', if it does indeed represent a new approach, aims to recognise nature in our narratives as a resiliently independent and equally historical agent. Only then can we talk properly of human interaction with the environment.

In the words of American historian Roderick Nash, environmental history goes 'beyond the human dimension to embrace all life'. Nash suggests 'that the environmental historian, like the ecologist, would think in terms of wholes, of communities, of interrelationships, and of balances'. 'This would indeed be history "from the bottom up"', wrote Nash, 'except that here the exploited element would be the biota and the land itself' (Nash 1972). The biota is no mere passive servant, however - no more than are those other exploited groups being written into history: the working classes, blacks, women. The revisionist histories giving voice to the experiences of these groups recognise the strength and subversity of their underworlds. So too do environmental historians seek to describe a natural world that has rhythms and histories of its own.

I began, then, to look at the forest itself more closely; I began to realise that it was a community of trees. The trees had names and life histories, too. And fire in this forest was different to fire in other forests. Why? Was Black Friday entirely a European creation, or was it part of an ancient cycle essential to the maintenance of this natural community? How could I know unless I extended my enquiry backwards and sideways, backwards through time and sideways across disciplines? I could not write this forest's history without understanding, at least in a rudimentary way, its nature. I began reading about fire ecology, and I started talking to ecologists. I quickly realised what good historians they are.

One ecologist in particular was helpful to me - David Ashton, a Melbourne University botanist who has spent his life, as he puts it, 'prying into the personal life of *Eucalyptus regnans*' (mountain ash) (Ashton 1987, 1990, 1991). He opened my eyes to another history of the forest that was essential to any understanding of its human dimensions. Ashton's own enquiry began in the late 1940s when he began to study an ancient forest of mountain ash in the Wallaby Creek water catchment area, less than 50 kilometres north of Melbourne. It is perhaps 300 years old and has escaped logging and massive fire. Hume and Hovell passed through it in 1824, paling splitters raided it in mid century, water resource managers protected it in 1872, bullockies burnt its understorey repeatedly in the early twentieth century, but it was 1949 before anyone really looked at it. David Ashton wished then that those earlier observers had recorded

more of what they saw, and he yearned to return to 1850 with a botanist's eye.

His task was to find out why this ancient forest was not regenerating, why it was not renewing itself. The forests that colonists had once considered limitless, 'virgin' and 'over-ripe', were now in many places denuded and destroyed as a result of frequent fires and intensive logging. Victorians had to urgently discover how to regenerate mountain ash. It was going to be a long experiment. Ashton needed to research the whole biology of the plant, its 'autecology', every thing about the organism that he could discover. How fast did it grow? How deep are its roots at various stages? How often does it flower? How viable are the seeds? What happens to them? The secrets of the forest - the key to its future - were to be unearthed by this myriad of questions about the life of one organism.

Ashton pieced together the story with patience and care (Ashton 1956, 1981). That word 'ash' hints at the Faustian bargain struck between the tree and its dominant environmental influence: fire. Ash-type species are different from most other eucalypts in their means of regeneration. They do not develop lignotubers under the ground from which they can renew themselves, and mountain ash and alpine ash do not coppice (grow new shoots) from the trunk. For their survival they are unusually dependent on their seed supply. Mountain ash dies out unless fire periodically sweeps the forest, for it is fire alone that releases the seed from the tree's hard capsules. However, the tree is also unusually sensitive to fire. Its bark is thin, and mature trees are easily killed by fire. Furthermore, if a second fire comes before the regrowth has developed its own viable seed, a whole forest can be wiped out.

Although very sensitive to light surface fires, mountain ash seeds prolifically in intense crown fires. In fact it possesses features that seem to promote such fires: a heavy fall of inflammable leaf litter particularly in dry seasons, hanging streamers of bark that take the flames up to the forest canopy, and open crowns whose pendulous foliage encourages updrafts. And how do these precious seeds survive the intense heat that they indubitably need? Ashton suggests that perhaps it is the very flammability of the crown that protects the seed in its capsule - just long enough. In the crown of the tree ahead of the fire front, the heat is brief and explosive and, some observers say, is followed by cool updrafts of air before the arrival of the surface fire. Ashton calls this fragile and complex circumstance a 'miracle of timing'. The fire also opens up the regrowth to the sun; it prepares and dries the soil, making it especially fertile so that the seeds can flourish.

Ashton's research revealed that mountain ash forests perversely need a catastrophe to survive. They need Black Fridays. But they need them at long intervals, every few hundred years. Black Friday was, then, not entirely a European

creation; it was part of an ancient natural cycle essential to this community of trees. The very existence of the mature even-aged ash forests admired by European colonists was evidence of earlier Black Fridays. In the wet mountain forests, it was the frequency - not so much the intensity - of fires that was a result of European settlement.

I began to realise that the wet, tall mountain ash forests defy many of the generalisations about Australian forest history. Eric Rolls' classic study, *A million wild acres*, is the history of a dry forest, the Pillaga Scrub in New South Wales, much of which grows on what were once good pastures (Rolls 1981). It is his staggering and reasonable contention that there are more trees in Australia now than at the time of European settlement. 'Australia', writes Rolls, 'was not a timbered land that has been cleared' (Rolls 1985:2). Aborigines kept the forests open with their light and regular burning. The prolific germination that always follows fire in Australia was kept in check by the plentiful wallabies, possums, bandicoots and rat kangaroos, which ate the seedlings. In the absence of Aborigines and small marsupials, forests thickened, and long-lived colonists remembered playing and working where trees and scrub later grew. Without Aboriginal fire management, wildfires erupted in these dry forests, and there they were very much a product of European occupation. Today's forests, argued Rolls, are not remnants of a primeval jungle: 'they do not display the past as it was, they have concentrated it' (Rolls 1981:399). They are different and new; they are exaggerated communities of plants and animals; they are especially vulnerable.

But what of the mountain ash forests? Rolls acknowledges that, along with the tracts and patches of rainforest on the eastern face of the Great Divide from Queensland almost to Victoria, they are among the few exceptions to this narrative (Rolls 1981:401). They have no resistance to fire. Their regeneration is precarious. They were not burnt lightly and regularly by Aborigines. Holocaust fires like Black Friday are endemic. Vast areas of mountain ash were cleared by settlers, and other areas were denuded by repeated fire. When Europeans first entered the tall forests, their testimony varied as to its density because of the variety and localised nature of fire regimes. In places they recalled riding a horse through the scant undergrowth; in others they had to fight through thick scrub to make a pathway. Where they did find an open forest floor, it was not due to regular burning but to the long absence of fire. The mature mountain ash forests excited them, and the few stands that survive today can be called remnants. Perhaps they do display the past as it was.

Investigating the nature of ash enabled me to go beyond a simple appreciation of them as tall trees to a realisation that their ecology was the key to many of the region's cultural patterns - its dramatic fire history, the chronology and sequence of forest utilisation, the placement of bush sawmills, the professional anxieties of

foresters, the imperatives of water supply managers. Ecology is not entirely a separate realm of specialist study; it is a systematic distillation of the sort of knowledge or bush lore that anyone who lives or works in a forest has to have. So ecology helped me plumb not just natural systems but cultural understandings.

Environmental history, then, demands that we go beyond a description of how humans perceive or interact with their environment over time. That might be very good historical geography or settlement history. We need to broaden the cast of historical actors to include plants and animals, whole ecosystems, even the elements. Such an approach challenges many of the conventions of history. One historian friend said to me recently: 'why are you talking so much about nature, about plants and animals? History is about chaps!' - thereby managing to be sexist and speciesist in the one phrase. Poet Les Murray welcomed Eric Rolls' pioneering environmental history, *A million wild acres*, for its democratic and ecological vision. 'In Rolls' presentation', he wrote, 'things human and non-human are all happening interrelatedly, and the humans barely stand out.' Murray reflected that this was a new kind of synthesis, a new kind of literature. 'There is something anti-ecological about the novel', wrote Murray, and one could add 'about history', for both assign all of agency to humans (Murray 1984:161, 167).

Environmental history demands that we incorporate the environmental sciences into our historical discourse, mining them - as we do the social sciences - for explanatory tools. And we can draw on the sciences as much as the humanities for our metaphors of description. Stephen J Pyne's recent fire history of Australia, *Burning bush*, offers an example of this imaginative approach (Pyne 1991, Griffiths 1993). We need more histories that are bound intimately to place and that also embrace the natural world, histories that are deeply attentive to human and biological parochialism. Environmental history makes best sense on a regional scale, and rarely on a national one. Historians will have to reach for boundaries other than national, state or shire ones. It is no surprise, then, that forest historians have led the field of environmental history - they are, as a matter of course, studying bio-regions, and within them they find that nature and culture are almost indistinguishable.

In much western thought, the natural world is seen as separate, as something there for humans to exploit or protect, but not to live with. Therefore we tend to see nature either as an artefact or as a wilderness - as something we have made ourselves and that is in our control, or as something from which we are absent. Good environmental history will, I think, integrate the human and natural worlds. The challenge for me in writing a forest history has been to describe an area that is neither natural wilderness nor human artefact; it is much richer and more exciting, it is something in between.

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CHAPTER 5

EFFECT OF SETTLEMENT ON THE FORESTS OF THE CENTRAL PLATEAU, TASMANIA

R. C. Ellis

Introduction

The southern portion of Tasmania's Central Plateau originally supported a forest of generally mixed age on upland areas, interspersed with open plains of varying size on level or concave topographic positions. Fire has been a major influence on the development of these, as of probably all, eucalypt forests and extensive cohorts of the principal species, gum-topped stringy bark (*Eucalyptus delegatensis*) and mountain white gum (*Eucalyptus dalrympleana*) have arisen following such fires. The plains were probably maintained in part by Aboriginal burning practices but of equal or greater importance have been infrequent severe frosts that cut back invading forest.

To a casual observer, much of the forested land may still present an aspect of more or less primaeval aspect, but the frequency with which, even in remote areas, one encounters the remains of fences, evidence of ringbarking on burned and long-dead veteran trees and remains of huts and other structures indicates a surprising intensity of past agricultural activity in this climatically inhospitable area. In the course of a study aimed at formulating silvicultural practices for *E. delegatensis* it became clear that an elucidation of the effect on the forest of past human activity was necessary to an appreciation of the effects of present practices.

Land settlement procedures

Extensive grazing of cattle and sheep in grassy highland forests had been practised from the early days of European settlement, but alienation of the more heavily forested land to private ownership dates mainly from early this century; by that time most of the good-quality agricultural land in the State had been sold and the Government doubtless appreciated a new source of revenue. However, extension of agriculture to the stony soil and harsh climate of the plateau was not a great success, although diligent farming of the better, less stony soils can produce good results.

Up until 1903 grantees of agricultural land were required to clear it completely before they could gain full title to it, but the cost of felling timber, grubbing stumps and ploughing could be 10 to 15 times the cost of the land. This, together with the requirement that grantees live on their grant, discouraged settlement on any but the best land. The *Crown Lands Act* of 1903, and its subsequent amendments in 1905 and 1911, required only that bush land be brought into use in a comparatively rough condition and it abolished the requirement for residence other than on the best land. This promoted the sale of much poorer agricultural land than hitherto.

Crown land was divided into Town Lands and Rural Lands. Upon the assessment of a surveyor, Rural Lands were further subdivided into first, second and third class land. First class land was valued at less or more than one pound per acre; second class land at between ten shillings and one pound per acre, and third class land at between five shillings and ten shillings per acre. These prices prevailed at least until World War I.

The intent of the Government was that land should be cleared and farmed. To this end, land was sold by purchase grant and only on credit, either directly at the minimum price for the class of land, or by auction with the minimum price as reserve. One third of the purchase price was added to service the credit. A purchaser paid one-fortieth of this credit price immediately and contracted to pay the balance over 14 years, with instalments that increased year by year to reflect the notional improving profitability of the enterprise; an elegant if complex scheme. Each year the purchaser was required to undertake improvements to the land at a minimum rate of two shillings and sixpence per acre (0.4 hectare) for first class land to an aggregate of one pound per acre and one shilling per acre, for second and third class land to an aggregate of five shillings per acre: eg. he had to expend on improvements the equivalent of the purchase price. Purchase grants could be resold at any time but the land became forfeit to the Crown if there was default in either payment of instalments or in expenditure on improvements. Title to the land was granted only when both requirements had been fulfilled. In practice, forfeiture for non-payment of instalments was usually acted upon but forfeiture for failure to improve the property was not, although title was withheld. Thus for several decades much unimproved land was bought and sold without either party gaining title to it. This anomaly was resolved only in 1976 when an Act of parliament waived the requirement for improvements before title could be granted.

Any person over 18 years of age could purchase land as follows, according to the Land Act of 1911:

1. one lot of first class land not exceeding 200 acres (81 hectares) or less than 15 acres (6 hectares) (in 1905 not exceeding 200 acres), and

2. one lot of second class land not exceeding 300 acres (121 hectares) or less than 30 acres (12 hectares) (in 1905 not exceeding 250 acres - 101 hectares), and
3. one lot of third-class land not exceeding 600 acres (243 hectares) or less than 60 acres (24 hectares) (in 1905 not exceeding 500 acres - 202 hectares).

Thus an individual could purchase about 1000 acres (405 hectares) of land of assorted quality. The purchaser paid all survey fees: one-fifth at the time the application for a purchase grant was made, and the balance in four equal annual instalments. Further purchases from the Crown could not be made until title to existing purchases had been gained.

In order to gain title a purchaser had to sign a statutory declaration and answer the following questions inter alia:

Are you residing on the land?

If not, does any other person reside on it?

What is the nature of dwelling house and any other buildings?

How many acres have been ringed (give date and cost of ringing)?

How many acres in cultivation and cost per acre?

What extent of fencing has been erected and nature and cost thereof?

What is the nature and cost of any other improvements?

A purchase could be discharged ahead of time only if all the improvements required during the life of the repayment schedule had been effected, in which case the cost of credit was adjusted down accordingly.

Initially, virtually all land was open to purchase, although extensive areas were leased for grazing as well. The requirements for purchase allowed the government some degree of control over the use to which the land was put and to some degree safeguarded against the concentration of large areas of land in only a few hands. Thus, in an area of highland forest which became known as the Clyde Run, 10 000 acres (4048 hectares) was surveyed in 1904 and divided into 41 purchase grants. All were third-class land and none was adequate to support a farming enterprise. Most were purchased, some were leased and all were used only for summer agistment of cattle and sheep from the lowlands.

Much of the southern highlands carried what we would today regard as splendid stands of timber. In the 1911 revision of the *Lands Act* provision was made for the Governor to appoint a Conservator of Forests who would report to the Minister for Lands. The Minister, as the Commissioner for the disposal of Crown Lands, was empowered to decline an application for sale of land that was likely to be required as a timber reserve. In officialese, the Governor in Council

could 'by proclamation in the Gazette except from sale and reserve to His Majesty such land as he sees fit for the preservation and growth of timber.' At that time, recognised eucalypt timbers were blue gum (*E. globulus*), stringy bark (*E. obliqua*) and swamp gum (*E. regnans*). Today *E. delegatensis* provides the bulk of sawn timber from eucalypt forest, but in 1911 virtually all *E. delegatensis* forest was in highland areas that were inaccessible by tramway, remote from market or port, and the timber itself presented difficulties in seasoning that were not solved until much later. So on thousands of hectares, magnificent stands of trees up to 35 or 40 metres tall and 60 to 150 centimetres diameter were dismissed in survey reports as 'gum and (white topped) stringy bark, of no commercial value'.

It seems paradoxical in view of the present emphasis on private forestry, that land was sold only for clearing and farming, whereas forested land could not be sold for the purpose of being managed as forest. The State reserved the ownership of all wood-producing areas to itself and granted leases of limited duration for timber harvesting. Only by destroying the forest could rural land be obtained freehold. The following examples are typical of a widespread practice that prevailed for 50 years!



Figure 1 Ringbarked tree dating from 1905-1910, surrounded by 70-year old regrowth.



Figure 2 Weatherboard cottage, stockyards and 30 acres of cleared land.
In 1927 these 'improvements' were valued at £427.

Purchase grants

The Clyde Run was surveyed in 1905. In July of that year Adam Turnbull Gibson of Epping applied to purchase a block of 302 hectares. The Surveyor's report was perfunctory and recorded that it was basalt country (dolerite in fact) with a clay loam gravel soil and carrying gum and (white topped) stringy bark. It was 104 kilometres from market, 51 kilometres from the nearest railway and 5 kilometres from the nearest road. It was third-class land with very little water and a value of five shillings per acre. Three sides of the lot had been fenced with dead wood fences erected by adjacent owners, value £25.14s.0d. The report might have added that the soil was very rocky, with extensive areas of rock pavement or scree.

The purchase price was £249, of which £6.4s.6d. was paid forthwith on 27 July 1905 (one-fortieth of the purchase price plus credit) with the balance to be paid by 1919. The purchaser also paid half the assessed value of existing boundary fences. This requirement provided a basis for strong disagreements among neighbours and between purchasers and former lessees or owners.

The lot was soon bought from Adam Gibson by Thomas Muirhead, also of Epping, who paid out the balance owing the Crown in 1911 and claimed improvements of:

Ringbarking 550 acres in 1905 at 1/3d per acre	£34.7s.6d.
Ringbarking 197 acres in 1911 at 1/4d per acre	£13.2s.0d.
An unspecified area was claimed as scrubbed, burnt and grassed 'spread over lease cost....' (almost certainly they were natural plains)	£25.0s.0d.
471 chains of fencing, boundary and internal	£50.6s.0d.
Total	<u>£122.15s.6d</u>

The area of the lot (302 hectares) was far above the maximum of 202 hectares that applied in 1905 and the expenditure on improvements fell far short of the basic requirement of five shillings per acre. Treasury was asked to advise on the claim for title and agreed to grant it. Perhaps Muirhead had influence in high places. The whole area of the lot had been ringbarked and charcoal on the ringed trees shows that subsequently it was heavily burnt. Sheep and cattle were grazed for many years but they tended to concentrate on the moister swales and wetlands, which thus were converted to pasture, and they probably used the upland mainly for shelter. On the upland, seed shed from the ringbarked trees soon re-established a dense forest of regrowth eucalypts. On third-class land such as the Clyde Run, clearing and cultivating for grass, let alone for crops, was not feasible, and so fencing and ringbarking were virtually the only two activities that could be costed to satisfy the improvement provision of the purchase grant. As a result, the whole 4048 hectares of the Clyde Run was ringbarked. Once title had been gained, or hope of gaining it abandoned, then little or no follow-up work was done.

Near Waddamana, a more determined attempt was made to establish a grazing property. The area was surveyed in 1904. In 1905 an application to purchase a lot of 259 hectares was made by Henry Albert Stacey of Jericho. The surveyor's report recorded that it was basalt country (dolerite again) with loam gravel soil carrying gum and (white topped) stringy bark. It was 105 kilometres from the nearest market, 47 kilometres from the nearest railway station and 6 kilometres from the nearest constructed road. It was watered by a well and was third-class land worth five shillings an acre.



Figure 3 Seed from this veteran survivor of ringbarking has regenerated the area following several fires. The present regrowth is 58 years old.

Between 1905 and 1927 the lot passed through the hands of Henry Stacey, Louisa Rogers and John Jones and Henry Oscar Jones. Finally Edward Knight the Younger of Jericho bought the lot in 1922 and in 1927 gained title to it after making the statutory improvements and by paying out the balance of the original credit purchase of £211, which had remained unchanged since 1905 (he actually paid £1500 for the lot). The improvements that Knight listed as having been made to the lot were:

The erection of a weatherboard cottage of 4 rooms with match lining and shingle roof, at a cost of £400.

A 2-stall stable of wood, cost of £20.

600 acres (243 hectares) of forest had been ringbarked: 500 (202 hectares) at 1/9d per acre and 100 acres (40 hectares) at 2 shillings per acre. A cost of £53.7s.6d.

30 (12 hectares) had been scrubbed, burnt and grassed at 8 shillings per acre - £12.

3 miles (4.8 kilometres) of boundary fence at ½-cost of £50 per mile - £75.

Erection of sheep and cattle yards at a cost of £15.

In 1927 these improvements were considered to be worth £750 or £1.3s.4d per acre, which was well above the minimum requirement. The weatherboard cottage was occupied for 40 years but is now vandalised and derelict. Between 1919 and 1930, Knight bought out several of his less able or less fortunate neighbours and worked the lots for raising sheep and cattle. This trend towards consolidation of lots was common in both the Waddamana area and the Clyde Run. As on the Clyde Run, on this and the other lots of the 1416 hectare Waddamana forest, little or no 'improvement' was effected once a purchase grant had been paid off. Other than on the 30 acres that had been cleared around Knight's cottage, regrowth of forest became established over most of the ring-barked area by 1935. Damaging fires in 1957 and again in 1966 killed some of this regrowth and established younger cohorts, so that today an uneven-aged and potentially very productive forest is in place.

Hydro-electric power development

Construction activities associated with hydro-electric power developments have affected many areas of the highland forest including the Waddamana forest. Although much of the forest was ringbarked early to waste, a market for timber developed with the commencement, in 1909, of work on the Waddamana Hydro

Electric Power Station. In 1905 Professor Alex McAuley of the University of Tasmania wrote a paper in which he described the potential of the Great Lake basin for generating hydro electric power. This came to the attention of a local engineer and the developer of a new electrolytic metal refining process who was seeking a large source of cheap power. In 1909 the Tasmanian Government granted a concession to the newly formed Complex Ores Co Ltd to use water from the Great Lake to produce electricity. Work began in 1910. The history of the building of the Waddamana power station is a topic in itself. It brought a large number of people to live in this remote area, in construction camps and in more permanent settlements centred on the two generating stations.

Large quantities of timber were required for the construction work, amongst which was the building of a wooden-railed tramway 27 kilometres long to connect Waddamana with the nearest trafficable road. All supplies for this large project were conveyed by horse-drawn trams over this route. In 1912 a devastating fire that originated most probably at a construction site, swept the surrounding forest and necessitating the rebuilding of much of the tramway. This fire is recorded in tree rings and appears to have been the first serious disturbance of the forest since the great frost and/or fire of 1837. The first stage of the Waddamana Power Station was opened in 1916 and the Station was completed in 1922. The demand for timber for the project created what was probably the first substantial market for timber in the highlands and may have assisted some grantees in clearing their lots. Stumps from this early felling are prominent in the Waddamana forest.

Recent events

The Clyde Run was subjected to what one might call blanket ringbarking, but the Waddamana forest has had a more complex history. The most rugged areas were not ringbarked but were grazed, burned and picked over for sawlogs until they carried largely degraded forest. In the ringbarked areas veteran trees often were left, possibly for shelter or for a supply of fence posts, and served as seed trees to regenerate the area. The area has suffered more damaging fires than the Clyde Run, probably because of its more ready accessibility since the power station was built, and so has a range of age classes of regeneration from (now) 26-60 years old. In the 1950s many lots were acquired by a sawmiller and they supported several spot sawmills for about 10 years until the fire of 1966 destroyed them.

Since 1977, when about 1416 hectares of the Waddamana forest, composed of 7 lots was acquired by the Waddamana Forests Pty Ltd, logging for pulpwood and sawlog has sought to remove veteran and fire-damaged younger trees in order to release vigorous regrowth, and to retain potential sawlogs. Thinning of the older cohorts of regrowth has also been carried out to salvage pulpwood that would



Figure 4 Construction of the Waddamana hydro-electric power station provided a market for timber. This stump dates from about 1912.

have succumbed to natural thinning and possibly to improve substantially the growth of retained trees.

In 1987, when Waddamana Forest Pty Ltd acquired the 41 lots of the Clyde Run, nearly all of them carried good regrowth forests of *E. delegatensis* up to 70 years old, with poorer stands of black peppermint (*E. amygdalina*) and Tasmanian snowgum (*E. coccifera*) on ridges and of cider gum (*E. gunnii*) and mountain white gum around open plains. These stands are being thinned and the best trees are left to grow on. In 1990, 54 hectares of Muirhead's original lot yielded 126 tonnes per hectare of pulpwood and 5.4 cubic metres per hectare of sawlogs during a partial harvesting operation, whilst 80 cubic metres per hectare of actual and potential sawlogs were left to grow on. The Company is growing trees: an activity that would not have been permitted in 1911.

This account was started with the suggestion that an elucidation of the history of

these forests could aid our appreciation of the effects of present practices. It has presented us with a nice conundrum. The Government's policy of issuing purchase grants of poor agricultural land generated a period of ringbarking and burning that amounted to a major catastrophe for the forest of the highlands. Yet that and subsequent fires generated a splendid new forest of diverse age: such is the nature of the genus *Eucalyptus* and especially of the 'ash type' eucalypts. Despite historical evidence such as this, many people continue to campaign against extensive forestry and particularly against the silvicultural use of fire to obtain regeneration, and instead advocate selective cutting of single trees or small groups. Selective cutting certainly has a place in the tending of existing stands, in the release of suppressed regrowth and the retention of small trees with the potential to grow into good sawlogs. But such practices in the highlands frequently produce little regeneration from seedlings and such as does occur usually fails to develop into a thrifty stand. On the other hand we can be confident that a heavy partial cut or a shelterwood cut followed by a hot and damaging fire will be very successful in regenerating the forest - just as was ringbarking and burning. But hot damaging fires waste and degrade existing trees. The challenge will be to meld the extensive and usually severe treatments necessary to obtain successful regeneration of the forest with the intensive treatments appropriate to the tending of existing stands.

Acknowledgment

I am indebted to Mr Barry Ford of the Department of Environment and Planning in Tasmania for researching the case histories of lots in the Clyde Run and Waddemana Forest.

CHAPTER 6

PENDERS PERPETUAL FOREST PLANTATION

Sue Feary

Introduction

This paper presents the findings of preliminary research into a timber processing plant and associated hardwood plantations near Tanja on the south coast of New South Wales. Although a small scale operation, Penders has a fascinating history which has been visibly influenced by European perceptions of the values of forests.

Despite beginning only thirty years ago, the plantations represent one of the earliest attempts in south-east New South Wales to utilise otherwise useless timber for economic gain. The success of the operation is the result of the vision and determination of a few people who were brought together by chance events. Following their purchase of Penders land, Sir Roy Grounds and Kenneth Myer joined up with German born John Cremerius. With advice from noted botanist Lindsay Pryor they transformed degraded native forests and cleared lands into carefully managed plantations. The technique of coppicing is used to improve yield and the unmilled timbers are pressure treated by an infusion method normally restricted to softwoods. The resultant product fills a niche in the market for round logs or 'bush timbers'. These are popular for garden landscaping, fence posts and in constructing dwellings with a distinctive architectural style.

All of the land that had been purchased by Myer and Grounds was donated to the New South Wales National Parks and Wildlife Service in 1976. With the recent tragic death of Kenneth Myer, another parcel of land has been bequeathed to the Service and is to be gazetted as part of Mimosa Rocks National Park (Figure 1). The future of the timber processing plant and the plantations is now being considered by the Service. The historical significance of Penders operation is one of the factors that will be taken into account, creating a situation whereby the objectives of nature conservation must be balanced against those of conserving our cultural heritage. On the other hand consideration must be given to the desirability of having a timber processing plant and native species not local to the area, within a National Park. Harvesting trees is an activity not normally associated with nature conservation and the maintenance of the plantation landscape will require a substantial injection of funds.

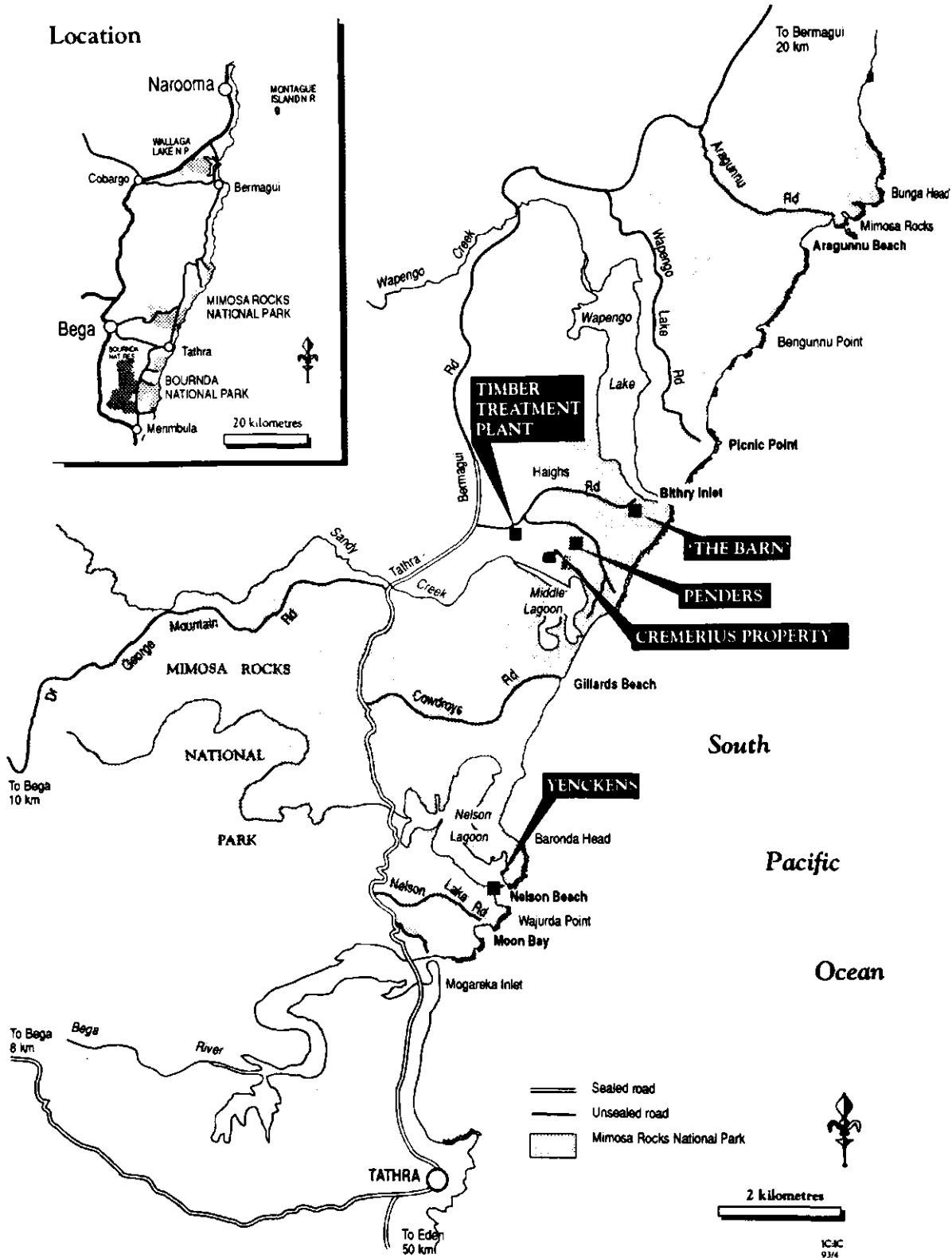


Figure 1 Map showing location of treatment plant, 'The Barn' and other places mentioned in text.

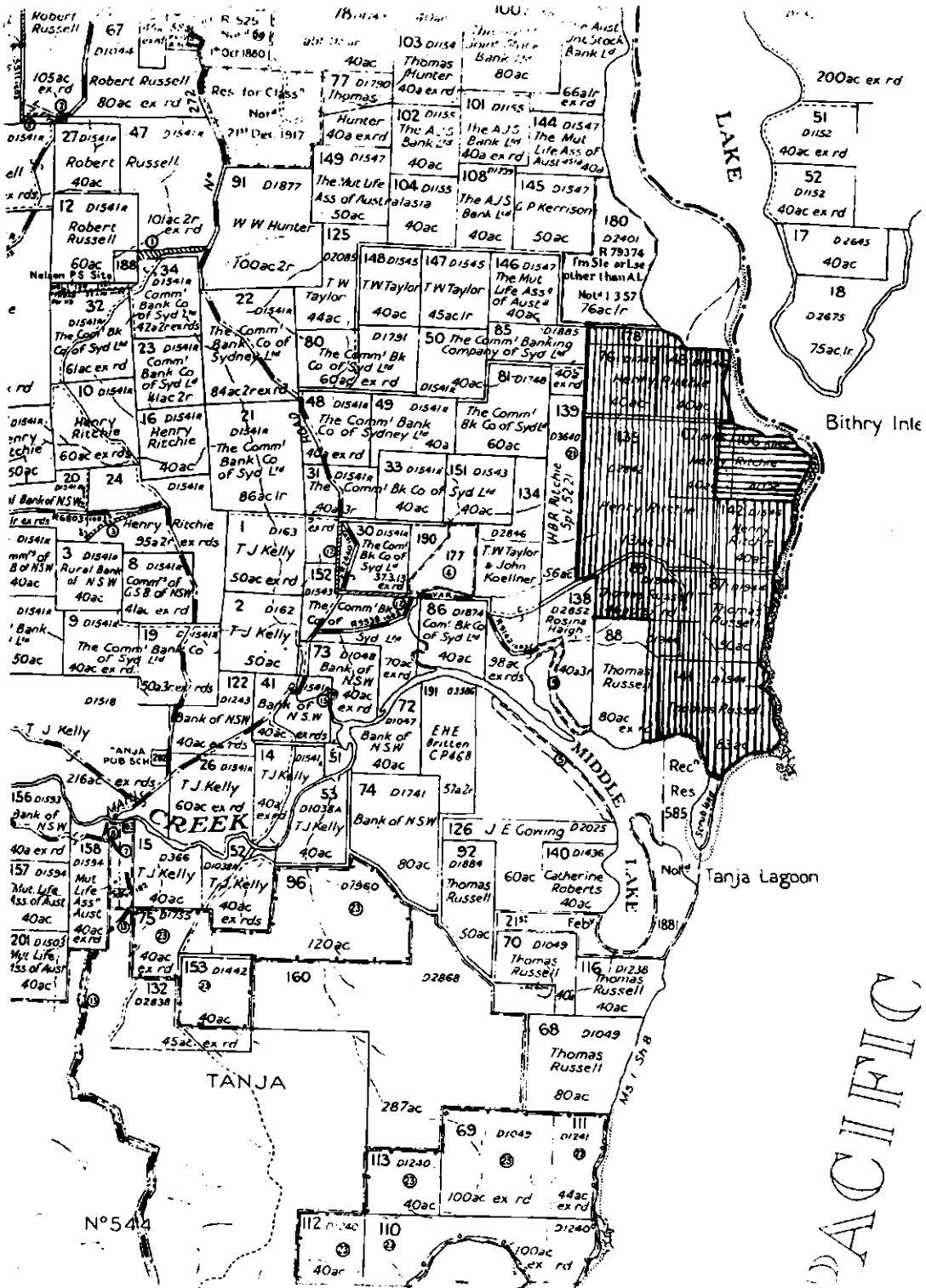


Figure 2 Parish of Tanja map (c. 1950s) showing extent of Penders land donated to NPWS in 1976 (vertical hatching). Location of current lease shown as horizontal hatching.

This paper attempts to demonstrate that the plantations are significant as an early example of their type. They are also associated with influential Australians; provide a glimpse of European perceptions of forests; and demonstrate an unusual suite of silvicultural techniques.

From Aachen to Tanja

The European connection was crucial to the history of Penders. John Cremerius, who was later to play such an important role in Penders, and his wife Mary, came to Australia in 1957. He brought with him over 1000 years of cultural traditions about the forests of Europe which combine a deep love for their natural beauty with a fervour to manage and utilise their products in an economically viable manner. Much of the development of these cultural traditions can be attributed to the influence of the illustrious Roman Emperor Charlemagne who played a pivotal role in bringing Europe out of the Dark Ages.

It is pure coincidence that Cremerius hailed from Aachen, the same city that Charlemagne had chosen for his capital during his great reign in the 8 and 9th centuries. Aachen is situated on the borders of Germany, Belgium and Holland and is best known for its magnificent cathedral where Charlemagne is buried. I have used this coincidence to reflect on the antiquity of the relationship between forests and people and on its global nature. Forest clearance and management was an important part of Charlemagne's strategy to unify and civilise Europe and a very brief digression into the history of forest practices in Medieval Europe may assist the reader to appreciate how these practices are manifest in a small corner of Australia.

Medieval forest practices in Western Europe

Forests were closely affiliated with both the secular and sacred lives of the people of Western Europe from at least the 8th century. Their clearance and management was seen by Charlemagne as essential to the advance of civilisation and rise of Christianity (Bainton 1964). At the time of Charlemagne's reign, Europe was thinly populated and covered with vast tracts of mostly broadleaved species forests, broken only occasionally by small settlements (Winston 1968:144). Christianity was still in its formative stages and a tribal lifestyle prevailed amongst the pagans. The Saxons were seemingly the most difficult to convert and to subdue them Charlemagne eventually resorted to massacre and desecration of their material culture (Winston 1968:37).

Forests were vital to the Saxons and other pagan cultures; for their resources, as a place to live and hide and as a part of their complex mythology. They were a source of firewood, timber and many types of food (Glacken 1967). The Saxons also practiced a guerilla type warfare for which forests were the backdrop for hiding them and their livestock.

The role of the forests in the religion and mythology of the pagans was perhaps the impetus for the widely held beliefs about the symbolic association between evil and forests. Saxon mythology included the worshipping of gods at sacred groves hidden deep in the forests, and one of their gods is thought to be represented by an ancient tree trunk (Winston 1968:37). Thomas (1984) writes at length of this association. He notes that the word 'savage' is derived from *silva*, meaning a wood. Woods or forests were evil places, inhabited by animals, not men. Thus any men who lived in the woods were rough and barbarous. Untamed woods were obstacles to human progress and their clearance and control were seen as synonymous with the triumph of civilization. Although there are some who do not agree with this view (see Darby 1956), history has shown that clearance of forests has gone hand in hand with development since Europe emerged from the Dark Ages. The frequent association of wild woods and danger in the fairy tales and folk lore of Hans Christian Anderson and other story tellers is a reminder of the attitudes of the time.

Part of Charlemagne's strategy to bring Western Europe under his control was to encourage the resettlement of lands which had been abandoned and reverted to forest after the downfall of the Roman Empire. As a great admirer of the Catholic church he also supported the growth of monasticism. As well as being places of prayer and intellectualism, monasteries were centres for the advancement of the skills of agriculture. The monasteries were self-supporting and the ability to till the soil and clear the forests was second in importance to prayer. Monks were put to the task of clearing the wilderness and bringing the surrounding land into cultivation (Bainton 1964). Figure 3 depicts monks employed in the Christian task of cutting down trees.



Figure 3 Artist's impression of 9th century monks clearing forests. Reproduced from Bainton (1964:136).

Forest clearance began in earnest in the 10th century when the dramatic population increases demanded clearance of forests and marshes on a huge scale, enabling an agricultural boom that was to be the turning point in the rise of civilisation (Russell 1968). Feudalism began to be obsolete with the rise of townships from the eleventh century. The towns weakened the power of the feudal manor by providing a place of refuge for runaway serfs and opportunities for employment. Russell (1968) suggests that rising populations in towns and the consumer excesses arising from improved techniques in agriculture were made possible by these earlier periods of deforestation.

By the thirteenth century most of today's human settlement had been established in Europe and what was left of the forests was being carefully managed as a resource. By the sixteenth century, the growing mining industry was placing huge demands on the forests for wood to make pit props and as a fuel (Darby 1956). Ship building was a heavy and continuous drain on the English oak and it would be true to say that many 'ships sailed in the forests' of western and central Europe (cf Chapter 16).

Increased demands for construction timber and pulpwood led to extensive plantings of conifers in Belgium and Germany in the nineteenth century thus transforming the landscape. A thousand years of clearing and replanting has produced forests which bear the mark of long exploitation and are markedly different from those which covered almost the whole area in Charlemagne's time (Darby 1956).

Tanja

Armed with these long cultural traditions of forest utilization, the German ethic for work and order and an aversion to waste, it is not surprising that John Cremerius quickly realised the economic potential of Australia's forests. After working for three years for the Belgium Embassy, the Cremerius family moved to the south coast. As lovers of the European forests and landscape they had been searching for an equivalent setting in the vastly different character of the Australian bush. By 1960 they had purchased the property 'Middle Lake Farm' at Middle Lagoon on a beautiful and unspoiled section of the south coast about 10 kilometres north of Tathra. The sixteen hectare property had been partially cleared by previous owners and like much of the surrounding area, its forests had been logged for decades. Most of the coastal forest between Bermagui and Tathra is now within Mimosa Rocks National Park or State Forest but it was once much more extensive. Despite an outward appearance of stability and age the forests had been subjected to a long period of modification and use, possibly pre-dating the arrival of Europeans.

The first white families arrived in 1846 and settled at Nelson Lake where they

grazed cattle. According to archival sources, at this time there 'was fairly open country covered with kangaroo grass.' (Russell 1978:1). The apparent absence of a shrub understorey suggests either the presence of a tall open forest at its climactic stage or deliberate burning by Aborigines. Aboriginal use of fire as a tool to maintain open vegetation and promote green pick for grazing macropods is well documented (Jones 1969). The presence of many Aboriginal archaeological sites in the area attests to their presence from at least 5,000 years ago and both ethnohistoric and archaeological evidence demonstrate that forests were important as a source of food, medicine and raw materials to make shelters and tools (Feary 1988). It is not unreasonable to assume that Aborigines burnt the forest as part of their subsistence activities and that the grassy understore may be the result of thousands of years of repeated firing. Whatever the reason, the dense undergrowth that now characterises the forests can be attributed to mid-nineteenth century clearing.

Following the Robertson *Land Act* of 1861, selectors purchased land for one pound an acre (0.4 hectare) and began the task of clearing the forests by ring barking, logging and burning. However, trees were not just an impediment to the development of the agricultural and pastoral industries; they were used by the selectors for many purposes. Spotted gum provided an excellent timber for building houses and fences and making roof shingles. Stringy bark provided roofing material for simple shelters and there was also a burgeoning wattle bark industry. Sleeper cutting was established around 1900.

From about the 1880s, the timber industry was a major employer and Tanja became well known for the variety and quality of its timber. Numerous sawmills sprang up in the area, the first being at Sandy Creek in 1877 (see Figure 2). Around 1915, Ike and Charles Innes established a sawmill near Bega, destined to be the last in the area. This was larger than the other mills, capable of handling logs up to 30 metres long (Russell 1978). Its closure in 1936 marked the end of an era of frenetic forest clearing and exploitation.

At Moon Bay, about 7 kilometres south of Penders, rusty mooring pins attached to the rocks show where Sydney-bound steamers received their loads of timber from sawmills in the surrounding area. The wood was transported to a punt by way of wooden chutes dug into the steep sea cliffs and then taken out to the waiting steamers (Freeman *et al* 1992).

By the time the Cremerius' arrived most of the area had been logged out and all of the local sawmills has closed down. Much of the land was degraded and the local community thought of the forests as 'dirty bush'. The Cremerius' established a small dairy farm, improving the pasture on the flats and lower slopes but leaving native forest on the steeper slopes and ridges.

The meeting of minds

Around the same time that the Cremerius family was building up their dairy farm, two leading Australian businessmen were searching the south coast for suitable land to purchase. Architect Sir Roy Grounds and businessman Kenneth Myer sought a bush hideaway far distant from their hectic city lives where they could relax and enjoy nature. In 1964 they purchased Penders from Mrs Innes of Bega, a descendant of the Innes brothers who operated one of the local sawmills earlier this century (Figure 2). The origin of the name 'Penders' has been difficult to establish as it does not appear on Land Title maps. Oral tradition suggests that the Penders owned the property prior to Mrs Innes. By the mid 1960s the area comprised cleared pasture and native forest dominated by spotted gum (*Eucalyptus maculata*). Early photographs show the property as rather degraded as a result of weed infestation and uncontrolled logging.

Penders is located adjacent to the Cremerius property and at the time of purchase, John Cremerius had it leased to run his herd of dairy cows. Grounds and Myer took him on as manager and it was not long before the collective minds saw ways of managing the forest to restore its beauty and at the same time make it productive. Cremerius and Myer both had a sound botanical knowledge and this combined with the considerable entrepreneurial and business skills of Grounds provided the impetus for the establishment of plantations and the tano-lith treatment plant. Well known Canberra botanist, Lyndsay Pryor, was called in to give advice on which species were best suited to the climate and a number of experimental plots were set up. Mary Cremerius still has many packets of seeds of *Acacia* species that had been provided by Professor Pryor.

Each of these people has left his own distinctive mark at Penders. Sydney blue gum, turpentine and spotted gum march across the landscape in neat, carefully tended rows. Every second or third tree has been coppiced, a testimony to the age old technique of improving timber yield. Amongst the park-like setting created by Myer are several tea houses where Myer and his Japanese wife took refreshment and enjoyed the scenery.

At Bithry Inlet, and a far cry from the Victorian Arts Centre is 'The Barn', designed by Sir Roy Grounds and built by local builders using timber from the treatment plant (Figure 4). 'The Barn' is described by some as one of the twenty best buildings in Australia because it combines the innocence of protective shelter with a deep natural simplicity engendered by the site (Taylor 1985).

Management of the forests

Sir Roy Grounds and Kenneth Myer originally intended to purchase about 16 hectares of Penders land. After negotiations with the owner, they ended up with



Figure 4 'The Barn' at Penders during its construction in the 1960s.

the entire 240 hectares. Part of the property was planned for subdivision but according to National Parks and Wildlife Service records, the land was sold on the condition that it not be developed. The subdivision never went ahead and the new owners began the task of restoring the forests to their former glory.

The main silvicultural techniques used in managing Pender's land included; preserving the existing forests, coppicing, clearing timbered areas considered to have no economic or conservation value, and establishing eucalypt plantations. The scheme was ambitious and judging by the number of newspaper articles it generated, was eagerly received by the local community.

Preserving existing forests

As a first step in restoring the forests, all weak and diseased trees were removed and burnt. Rotted timber and other forest floor litter was cleared, together with much of the understorey. This reduced risks from wild fire and the spread of diseases carried by fungal spores. A regular maintenance programme was carried out to keep the area under the canopy free of scrub and young trees.

Coppicing

At the recommendation of Professor Pryor, the technique of coppicing was introduced at Penders. Coppicing is commonly practiced in Europe but is relatively rare in Australia, being limited to small scale firewood production. Although labour intensive, coppicing is an effective approach for improving timber yields where large logs are not required.

When felled, the trees are cut about eight inches from the ground. All but the lowest of the epicormic shoots are removed and this is nurtured by the parent tree until it develops its own root system (Figure 5). Most coppicing is done on



Figure 5 Three year old tree showing coppicing technique.

spotted gum which is a vigorous grower producing strong stems up to 3 metres high in 12 months. At Penders every third or fourth tree in about 120 hectares has been coppiced, resulting in a landscape with a very distinctive character.

The success of coppicing depends on a rigidly adhered to cutting cycle and retention of cleared open areas between the coppiced trees. This allows up to seven trees to be obtained from the same stump. A recent article (Anon 1992) describes conservation measures applied to 400 year old trees in Burnham Beeches in England. The beeches and oaks are relics of a medieval practice of pollarding where branches are repeatedly removed at around head height to provide firewood and poles. The number of trees has fallen from 3000 in the fifteenth century to 500 in 1992 because pollarding had ceased and grazing had been removed. Using advice from a fifteenth century textbook experimental pollarding has recommenced, to stimulate regrowth and maintain this striking cultural landscape (Figure 6).



Figure 6 Tree pollarding in Great Britain. Burnham Beeches, Buckinghamshire as they were in 1860 (top) and as they are today (bottom). Redrawn from *New Scientist* (1992:6).

Plantations

Over about a decade from 1964 eucalypt plantations were established on about a third of the property. Cremerius and a team of up to seven experienced woodsmen from the local area planted thousands of seedlings, mostly on land that had been cleared by previous owners. Some of the most degraded spotted gum forests were cleared to expand the area available for planting. Not all of the cleared timber was wasted, as some was salvaged for processing.

As well as spotted gum, a number of species not native to the area were planted. On the advice of Professor Pryor, these included Sydney blue gum, turpentine, flooded gum and forest red gum. The plantations were experimental in the sense that at the time it was not known which species were best suited to the light, deep soils and an annual rainfall of up to 660 millimetres.

Several techniques were trialed to determine the best survival and growth rates of seedlings. Planting of seedlings directly into the forest was the least successful, with growth varying from a few centimetres to about 30 centimetres per year. Much better results were obtained by propagating seedlings in a nursery and planting them out when three months old. The nursery was originally set up on Cremerius land because Penders had no water supply. In later years a dam was built and a pump installed to irrigate the seedlings.

Prior to transplanting, the forest floor was prepared by ripping to remove weeds and aerate the soil. After several months the seedlings are fertilised with superphosphate. This intensive and careful method of cultivation produces saplings over one metre high in seven months. In 1969 a newspaper article reported that the saplings from the earliest plantations of turpentine had grown five to eight metres in less than three years. The article describes the plantations as 'Beautiful to look on, each tree being healthy and well proportioned' (*The Land* 20 Feb. 1969).

The process is one of continuously tending and replanting trees as they are harvested. By 1982, 1050 trees were being planted to the hectare and Penders contained about 60,000 trees in various stages of growth (*Times of Bega* 18 Aug. 1982). Figure 7 illustrates a portion of the Sydney blue gum plantations in 1982. The straight rows of trees with a grassy understorey are a testimony to years of diligence by a man who was committed to what must be a pioneering attempt at ecologically sustainable development. John Cremerius died in June 1990 and his obituary encapsulates his philosophy which combined a love of the forest with a knowledge of what it could provide (*Bega and District Times* 15 Aug. 1990).



Figure 7 Penders Plantation of Sydney Blue Gums, 1982.

The end product

The result of the silvicultural methods is round logs of varying diameters. Any wood that could be cut into 600 millimetre lengths was considered to have commercial potential. However any potential market for round logs of hardwood has to compete with the softwoods which are fast growing, light and easy to handle. Development of techniques to make eucalypts grow fast and an emphasis on harvesting of young trees can overcome this competition. Add to this a tanolith treatment process to prolong the life of the wood for up to 20 years and there is a viable economic concern, albeit on a small scale (Figure 8).

The treatment of the timber involves a simple but effective process which was devised by Grounds, Myer and Cremerius with advice from CSIRO and Mr Jim Ryan. The latter owned a timber treatment plant in Queanbeyan, near Canberra and obtained timber from the Bega area for his business. Part of the impetus to have a local timber treatment plant came from Sir Roy Grounds. He had his heart set on building an architectural whimsey at Bithry Inlet using Penders round logs but balked at the expense of sending untreated wood to Queanbeyan and then bringing it back again. The first treatment plant was thus stationed at Bithry Inlet where it was powered by a wooden windmill, now a ruin. The plant was subsequently moved because of the detrimental effect of the salt laden air on the untreated wood.

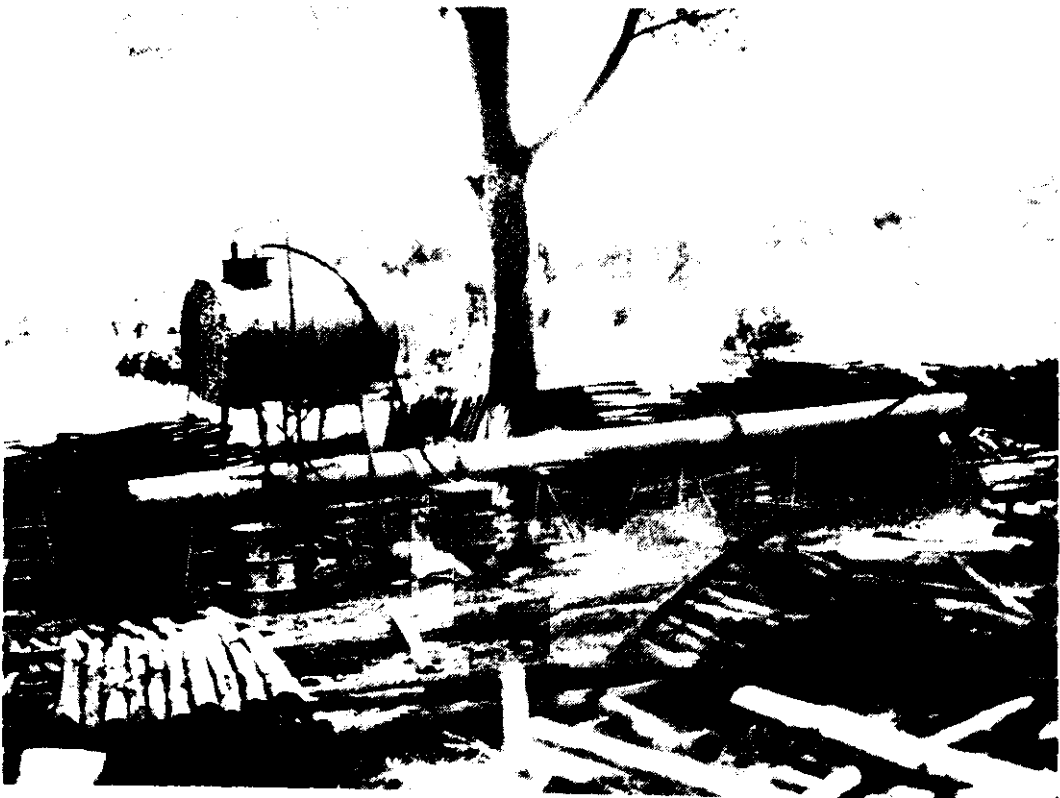


Figure 8 Penders Tanolith treatment plant in earlier years.

The process involves replacement of the sap in the wood with a chemical mixture of copper, chromium and arsenic under pressure of about 8 kilo Pascalls and is generally used with softwoods. This process replaces earlier more dangerous ones of soaking logs in baths of creosote (never used at Penders). After harvesting the logs are cut to the required length and sun dried on pallets. They are then bundled up and fed into a long metal cylinder which is sealed. A vacuum pump removes all the moisture and sap and the chemical mixture is forced into the heartwood under pressure. The replacement takes about an hour depending on the size of the logs and results in a distinctive but not unattractive green tinge to the wood. Today, this is a two man operation at Penders, overseen by Mary Cremerius who carries on her husband's love of the forests. The process is almost entirely manual, the only concession to reduce heavy labour being a trolley to assist in placing larger logs in the cylinder.

During the formative years of Penders the young, small saplings provided an unexpected source of revenue. Oyster growing was and still is an important industry on the far south coast and oyster growers once used mangroves as a substrata for the shellfish. Many mangrove beds were destroyed by reclamation and pollution and no other wood was available that could resist the marine borer. Penders treated saplings proved to be highly valuable as oyster stakes and were readily procurable at reasonable prices (*Australian Country* 1968). In later years as the trees grew larger, the treated fence posts were very popular with Monaro farmers who found them to be more resilient than pine fence posts. There is a wide variety of other uses including telegraph poles, pergolas, garden landscaping, bush furniture and structural framework for farm outbuildings.

A number of houses around Mimosa Rocks National Park have utilized the timbers from Penders. 'The Barn', discussed earlier was built almost entirely with Penders round logs. The nine sloping poles which provide the main framework are now badly rotted at their bases. Evidently this is due to the absence of a vacuum pump in the early design of the sap replacement process such that timber preservation was not complete. This was apparently rectified by a local plumber who modified CSIRO's original design. Other buildings utilising Penders products include Professor David Yenken's house at Nelson Lagoon, which was designed by another noted Architect, Graeme Gunn, and 'Ness' at Wapengo Lake, the home of the late Professor Manning Clark.

Conclusion

In this paper I have attempted to show that the history of Penders comprises disparate storylines that have been woven together. The story is most significant in the context of local history but some of the strands have wider management and philosophical implications.

In the first instance, it picks up on the subject of Griffith's paper (Chapter 4) of the forests as historical artefacts in their own right, rather than merely backdrops to historical events. The dramatic effect of straight rows of eucalypt trees, the coppiced trees and the park-like setting are very visible reminders of the influences of human beings. The individuals involved were all highly influential in their chosen fields and Penders provided the stimulus for their collective vision to be realised.

Secondly, it places current issues about forestry management practices into an historical context. The last two decades have witnessed the rise of sometimes bitter conflict over management of Australia's old growth forests. The planting of hardwoods to provide timber has been advanced by conservation groups as a way of conserving the natural values of forests. There has been some opposition to this course of action, particularly by the timber industry, on the grounds that plantations would not be economically viable (South East Forests Regional Consultative Committee 1991).

Penders operation demonstrates that hardwood plantations are not beyond the realms of possibility providing they are carefully managed. The philosophy of minimizing waste and maximizing returns which has existed in Europe for centuries is encapsulated in the following quote from a Bega newspaper:

In an age where waste is too commonplace for comment and in a country where waste of timber resources in particular has become a tradition since the days of the cedar-cutters it is indeed to be hoped that the fast regeneration methods and economical use of resources being employed at 'Penders' will become the practice in Australian forests in the future (*The Bega News* 20 Feb. 1970.)

Acknowledgements

My thanks go to Mary Cremerius for access to her extensive archival collection and for sharing with me her love and enthusiasm for Penders. Stephen Legge directed me to useful references on forest management in Medieval Europe and Paul Packard and Kieran Hotchin provided stimulating discussion on the same subject. Stephen Deck, NPWS, researched office files and commented on early drafts of the paper.

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CHAPTER 7

LAND USE HISTORY OF THE WHITE CYPRESS PINE FORESTS IN THE SNOWY VALLEY, KOSCIUSKO NATIONAL PARK

I.F. Pulsford, J.C.G. Banks and L. Hodges

Introduction

The lower reaches of the Snowy River in NSW (known locally as the Lower Snowy River Valley) lie in the southern part of Kosciusko National Park, the area adjoining Victoria's Alpine National Park. In developing a management strategy, the NSW National Parks and Wildlife Service reviewed the area in 1983 and found that the condition of this ecosystem posed serious and significant problems for the management of the Snowy River catchment. These problems were identified as widespread sheet and gully erosion, the apparent lack of continuous white cypress pine seedling recruitment, the lack of ground cover in many areas, the periodic occurrence of large numbers of rabbits and the invasion of large numbers of introduced plants.

Effective and efficient modern land management ideally requires a socio-economic input in addition to detailed knowledge of the ecosystem processes and the history of past land uses. This means that today's land managers need information on environmental history, and the rates, direction, and magnitude of ecological changes in order to establish meaningful management objectives, for only then is it possible to make ecologically sound decisions. Simple decision making during the short work experience of a manager is of necessity essential for day to day management, but is often inadequate for understanding and predicting trends or the outcomes of management actions (Clark 1990). An example of short-sighted and inadequate decision making is to be seen in the history of land management in Yellowstone National Park, USA. This is filled with examples of *ad hoc* and politically driven land management philosophies and practices which resulted in gross and inappropriate changes to the park's ecosystems due to the ignorance by park management of the interrelationships of crucial components of the ecosystem in natural ecological processes (Chase 1987). It is to be hoped that the lessons learnt here will be carried into park management elsewhere.

This paper is based on a major study into the environmental history of the Lower Snowy River Valley that lies in Kosciusko National Park (Figure 1; Pulsford 1991). It focuses on changes since European settlement to the white cypress pine forest which extends along the lower valley slopes, and it seeks the causes of major ecological changes and their chronology in order to better understand the past and present condition of this ecosystem.

The forests are dominated today by a native conifer, white cypress pine (*Callitris glaucophylla*) which occurs in dense stands in association with white box (*Eucalyptus albens*) and in part of the white box - white cypress pine alliance first described by Costin (1954). This alliance extends along the deeply incised middle section of the Snowy River Valley in the Kosciusko National Park and downstream into Victoria's Alpine National Park. Curiously it includes components of plant communities typically found today in the semi-arid lands west of the Great Dividing Range. It is an eastern outlier trapped in the rain shadow of the Snowy River Valley. On the valley slopes above the white box - white cypress pine zone, the forest grades rapidly through dry sclerophyll forest to wet sclerophyll forest, subalpine woodlands and forests and finally into alpine herb fields over a short distance of 30 kilometres. This truncated vegetation sequence reflects the steep altitudinal and climatic gradients in this part of the Kosciusko National Park. The white cypress pine forest extends over some 7,000 hectares or approximately 1 per cent of the Park. It is surrounded on all sides by mountains which create a deep rain shadow in the lee of the progression of a predominantly north-easterly air stream which passes over the Great Dividing Range. The mean annual rainfall is only 583 millimetres (Clayton-Greene 1981) with a slight peak in early summer months, this summer rain typically coming in intense local storms. Monthly temperatures range from a mid-summer mean of 24°C and a mid-winter mean of 7°C (Costin 1954), which illustrates the strongly seasonal character of the climate with warm to hot and usually dry summers and cool winters with frequent frosts along the valley floor. Geologically the area consists predominantly of intrusive granitoids such as late Silurian biotite granodiorite and tonalite (Brown *et al* 1959). These rocks are overlain unconformably by highly folded Ordovician sedimentary rocks.

White cypress pine grows on coarse grained soils derived from the decomposition of low fertility granodiorites, these sites being too dry to support eucalypt dominated forests. Over extensive slope areas, particularly on the hot dry north-westerly aspects sheet erosion has occurred on a large scale (Clayton-Greene 1981; Costin 1954; Worboys 1982). Here most of the A and B horizons have been lost often leaving a boulder strewn surface. Erosion is less severe on gentle slopes and on the cooler aspects which often retain a good soil depth with the A horizon intact. Much of this erosion is likely to have occurred in the recent past, that is since European settlement. The nature of the original tree cover and the

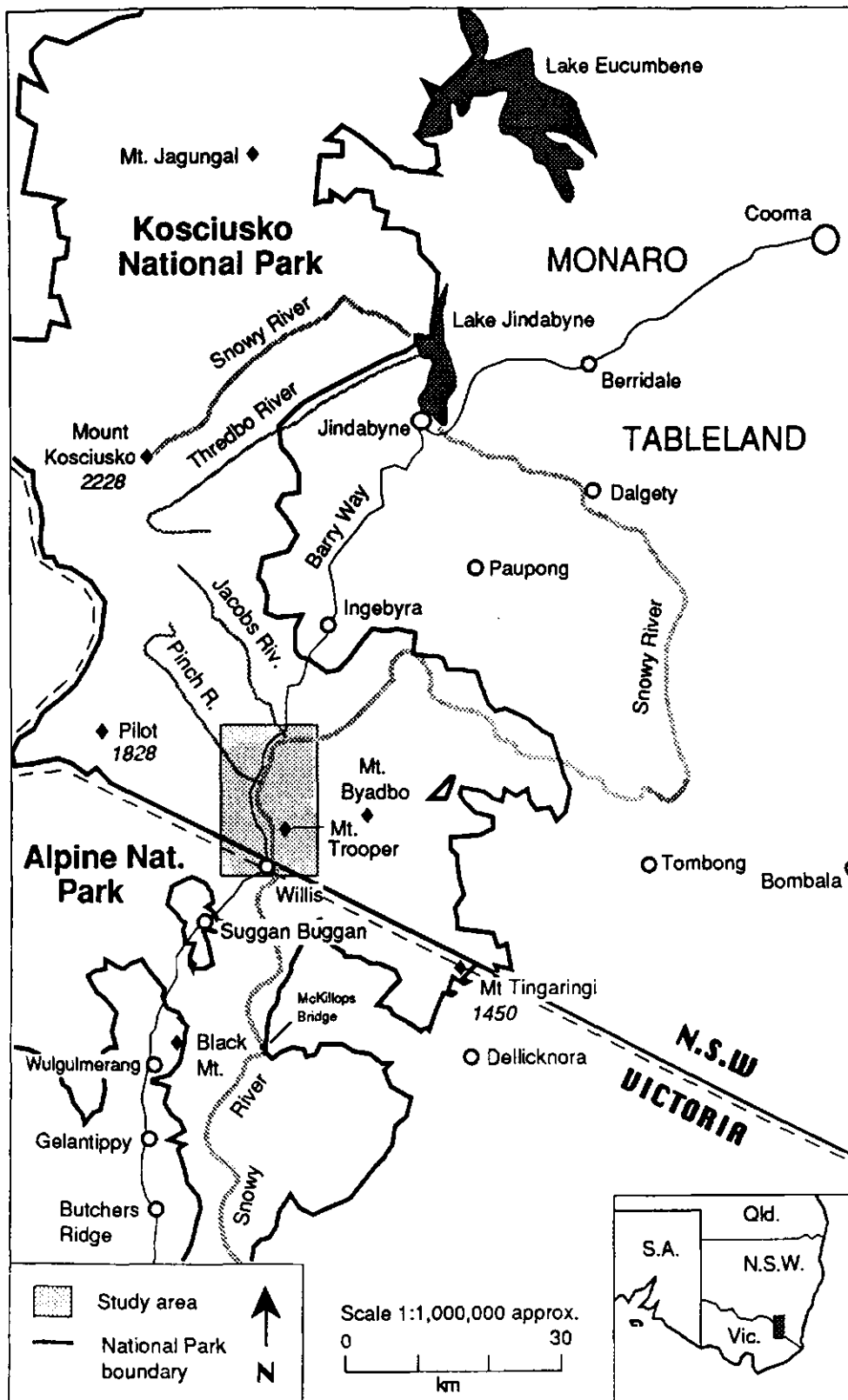


Figure 1 Location of study area within Kosciusko National Park.

sequence of events that brought about change had not been determined and this provided a challenge to develop an environmental history which would help to place these changes in perspective.

The historical record

The study focused on the history of these conifer forests and was undertaken in three parts. The first comprised review of the literature and oral anecdotal material. It sought scientific and historical evidence of the pre-European condition of the valley and the nature and impact of subsequent land uses, the sequence of major disturbances such as grazing, the arrival of rabbits, fire, droughts, and erosion periods, and the decline and eventual loss of the old growth woodlands and the regeneration of the regrowth forest. The second part attempted to establish a profile of the pre-European woodlands and the subsequent changes to the woodland since European arrival. Dendrochronology provided tree ages and fire dates establishing a time frame for these changes. Finally a synthesis of all the evidence provided an environmental history for the valley forests.

Prior to European settlement the central and southern parts of the Monaro tableland including the study area were occupied by the Aboriginal peoples of the Ngarigo linguistic group (Hancock 1972). Archaeological surveys of Aboriginal relics (Flood 1973; Flood 1980; Lewis 1976; Margus 1970) have revealed that in the southern highlands including the Australian Alps, Aboriginal communities were concentrated in the comparatively frost free, low elevation valleys such as the Snowy River Valley (Geering 1981) particularly during cold winter months. From this interpretation the Snowy River was an important corridor providing access to and from the high country and the coastal plain. Thus the impact of Aborigines on the valley ecosystems could have been considerable but the nature and extent of this impact remain a matter of conjecture for the present. Nevertheless the condition of the area prior to and in the early days of European settlement was very different to that of today and this is reflected in an early description made by Robinson in 1844, shortly after the first Europeans entered the valley :

Callitriess [*sic*] from four to five feet in circumference grew amid shrubs of every variety of tint. The Country is well grassed and abounds with Cattle, the Soil varies from a rich black mould to a chocolate. (Mackaness 1941).

This is in marked contrast to Costin's report of the early 1950s that the condition of the area was characterised by dense regenerating thickets of white cypress pine and bare eroded soils (Costin 1954).

European graziers first entered the Snowy River Valley in the early 1830s and quickly displaced the Ngarigo people, who possibly numbered no more than about 500 individuals. The number of Ngarigo diminished rapidly after 1856 (Hancock 1972) in the wake of persecution, diseases and rapid dispossession from their lands. Unfortunately nothing was recorded of their culture that would have provided clues as to how they managed the landscape and perhaps manipulated the tree cover.

The major European land use was grazing carried out on defined 'runs' and later 'snow leases' some of which extended from the Snowy River up to the high elevation subalpine pastures which were used for summer grazing. Grazing in the Snowy River Valley would have taken place essentially all year round depending on seasonal conditions. The valley provided a winter refuge for stock which spent the summer months in the mountains thus allowing summer growth in the valley to be saved for winter feed. It also provided relatively easy access between the coast and the Monaro tableland, and for this purpose was traversed by a series of stock routes. As part of their land management, many stockmen frequently burnt the forest to promote palatable feed for stock. Some, probably limited, clearing also took place in an attempt to improve pasture growth. Other minor land uses included prospecting and limited cropping, and some logging and hunting.

By the end of the century a new and unwanted grazing animal appeared. Rabbits, which had spread rapidly across the Monaro, arrived in the Snowy River Valley by 1900 (Platts 1989; Stoddart and Parer 1988). They reached plague proportions in good seasons, their numbers crashing in drought years but with enough surviving to ensure a rapid build up again when the good seasons returned (Wakefield 1970). The impact of the rabbit was significant as it cropped herbage to ground level and even chewed roots in dry times exposing the soil to erosion when the rains came. The full impact of this rodent persisted until the 1950s when some measure of control was imposed with the introduction of myxomatosis.

Historical accounts help us to visualise the changes which were taking place last century in the years following European settlement. One telling observation of the study area was recorded by Harnett (1948). It describes the dramatic changes to the forest as follows:

The old stockmen told me that the Willis was 'good' until the young pine came like wheat in 1878, before that there were only large trees and in 1935 I saw only about a dozen of these, mostly dead but some 2'6" in diameter - the young pine extends to the 2000 ft. contour and has now thinned out, but it killed all the grasses and clovers and the topsoil then washed away except on a thin fairly level patch to east of top of Pinch Mt.

In another, one of the earliest land-holders, W. Crisp of Jimen Buan, described how in the 1860s water courses became silted up and palatable grasses were replaced by less nourishing grass as a result of grazing (Hancock 1972).

Evidence for changes in forest structure

Within the dense regrowth forest stands of white cypress pine, evidence of the former forest can still be seen in the form of large old growth trees now mostly dead but some with an occasional green branch. These remnants bear testimony to a grander forest in the valley. The old trees are taller than the spindly regrowth and have heavy wide spreading branches showing that they grew up and developed as wide spaced trees with spreading crowns. Some have undoubtedly been lost to past fires but enough survive in parts of the forest to provide an unusual and unique opportunity to reconstruct the old growth forest. Three transects totalling 1.7 kilometres were made to collect data on the old and new regrowth forest (Pulsford 1991). The transects ran essentially parallel to the river and traversed east - west ridges providing data from the contrasting north and south facing slopes. The location and diameters of standing and fallen old growth trees were recorded, and the density and diameter classes were recorded for the regrowth trees. From this reconstruction estimates were made of the spatial distribution, density (Figure 2), bole diameters, and crown cover (Figure 3) (Pulsford 1991). In addition the presence of fire scars in these old growth trees provided a further clue to the history of this forest. This analysis showed, among other things, that there were two distinct stand types in these valley forests. A low density woodland of white cypress pine was located mostly on ridges and the drier slopes with white box confined to the cooler, sheltered and presumably better watered slopes. The white cypress pine comprised the larger tall trees, which mostly occurred in clumps with some scattered individuals. In contrast the large and presumably old white box trees were not clumped but occurred as scattered individuals. These large and presumably older trees were interpreted as comprising the original old growth woodland which the first graziers would have known well. Superimposed on this woodland are the dense stands of young regrowth trees which form a much younger and considerably denser forest. On north aspect sites the old growth white cypress pine averaged about 30 trees per hectare, 9 for white box, while the dense regrowth averaged 2,600 trees per hectares, 95 for white box. The white cypress pine dominated northerly aspects while white box dominated southerly aspects.

To further understand the dynamics of these stands tree age data were needed. Dendrochronological techniques were adapted and applied only to the white cypress pine as the white box lacks regular tree rings. Despite the difficulties of aging white cypress pine (Dunwiddie and LaMarche 1980; Ogden 1982; Perlinski 1986), which include a high frequency of intra seasonal growth rings, it was possible to date tree rings and to obtain estimates of tree ages in some

trees. The application of growth index models (Fitzpatrick and Nix 1973) helped to confirm that seasonal conditions would produce intra seasonal growth rings in most years and using this it was possible to develop a satisfactory chronology from which tree ages were determined. Age estimates for the regrowth trees placed their establishment from the mid 1880s to the early 1900s.

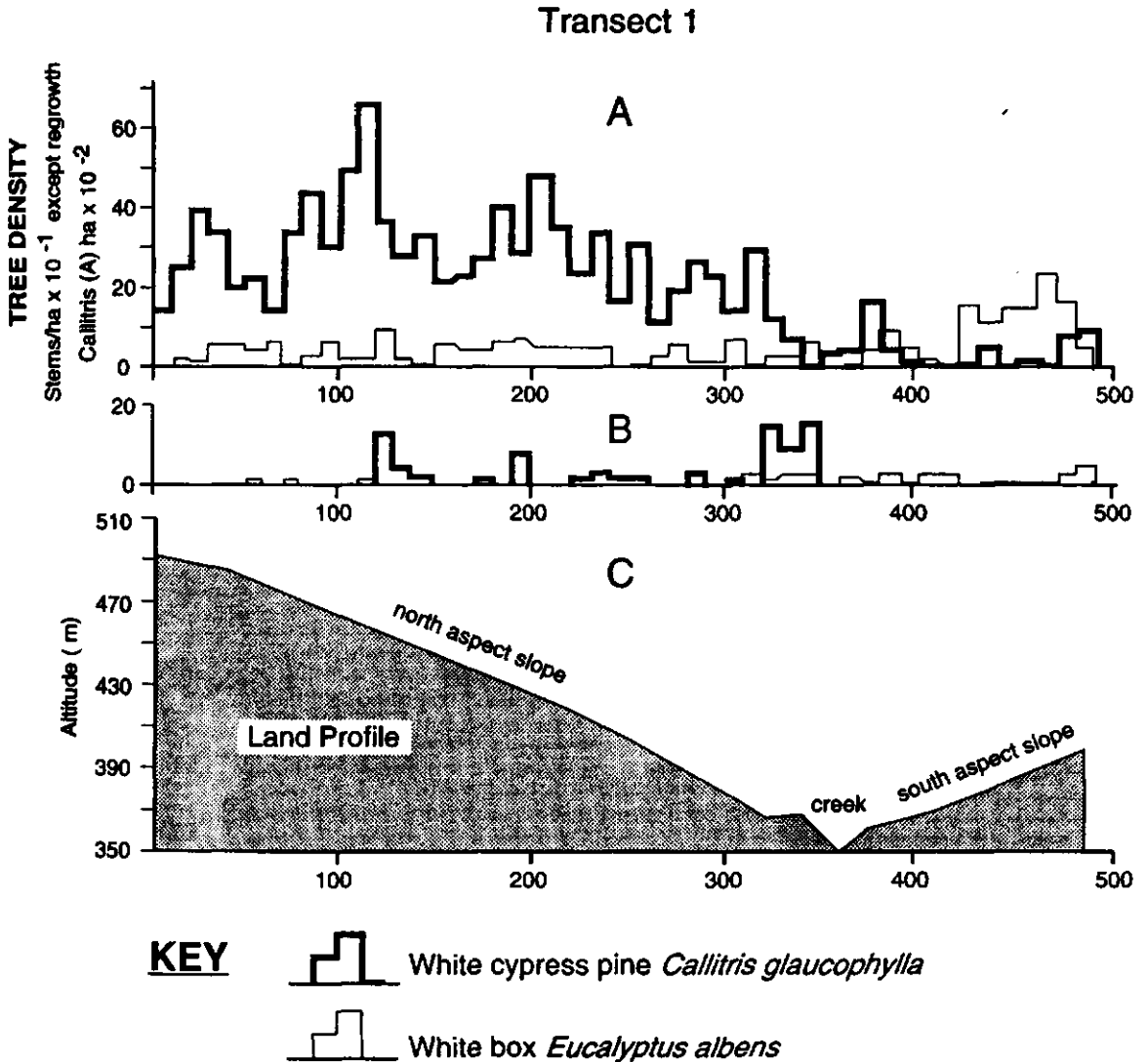


Figure 2 Stem density of *Callitris glaucophylla* and *Eucalyptus albens* along Transect 1. Diagram A: regrowth forest (post-European); B: old growth woodland trees (pre-European); C: land profile along transect.

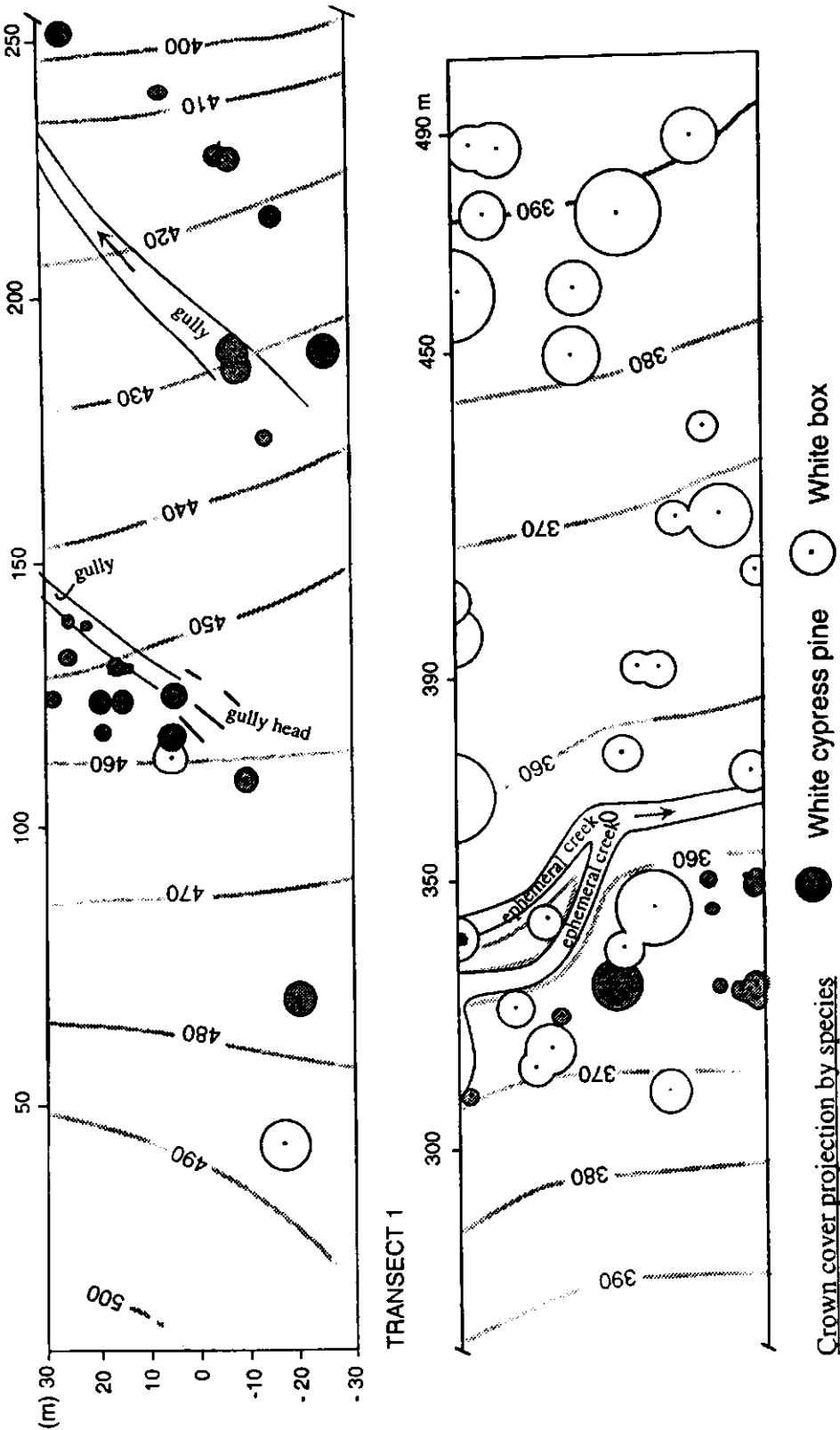


Figure 3 Map of Transect 1 showing tree distribution and estimated crown cover projection, for old growth pre-European white cypress pine (*Callitris glaucophylla*) and white box (*Eucalyptus albens*) woodland, in the Lower Snowy River Valley of Kosciuszko National Park. Note the clusters of white cypress pine on the north aspect slopes (0-350 m), near creek banks and disturbed heads of gullies. White box mostly occurs on the south aspect slopes (350-490 m).

This fits with the arrival of the rabbit around the end of the century since little or no regeneration would have been possible once the rabbit had established itself in the valley, as it grazes the pine seedlings, killing them. In fact most of this regeneration would have had to occur earlier, rather than later, for large seedlings to be in place by the arrival of the rabbit. This places regeneration in the 1880s rather than the 1890s. This is not to argue that no regeneration has taken place this century, as rabbit populations fluctuate easing the grazing intensity at intervals, but importantly most potential seedbed sites were now occupied and there would have been little or no seed available as the old growth trees declined and those of the regrowth stands were too dense and spindly to produce any appreciable seed. The sampled old growth trees dated to between the late 1790s and the 1840s, which was a little surprising as this makes them rather young trees at the time of European entry into the valley. However further dating of these trees is expected to show older dates.

Fire has obviously been an important element in the valley, either the lack of it at times, or its frequent occurrence. Establishing a fire history is therefore an important part of the environmental history. This has already been shown to be the case in other parts of the Australian Alps sclerophyll forests (Banks 1987). The pattern of use and intensity of fire has changed dramatically since settlement in south-eastern Australia (Jacobs 1963) and fire scar data has shown this to be the case in the subalpine snow gum forests (Banks 1987; Pryor 1939; Raeder-Roitzsch and Phillips 1958). Forest fire histories can be assembled from two primary sources. Off site data sources include official records, private documents, newspaper reports, oral accounts and ethnohistory. On site sources include fire scars, regeneration events, growth pulses or surges in tree ring widths, wood chemistry and the presence of charcoal layers (Banks 1989). Similarly, this study assembled evidence of past fires by dating fire scars and post-fire growth pulses in tree rings. Fire frequencies and fire free intervals were then used to interpret changes in forest stand characteristics and past land uses (Arno and Sneek 1977; Banks 1982; McBride 1983).

Field investigation revealed that 27% of old growth white cypress pine trees from hot north aspect sites had one or more fire scars. Old growth tree ring chronologies were obtained by cross dating between trees with a chronology established from a cool moist site (Mt. Trooper) to trees from a hot dry site near the old cattle yards at Willis. Cross dating was successfully carried out on six old growth trees from sixteen old growth and eight regrowth trees sampled. The fire history in the southern sector of the valley was derived from dated basal fire scars and post-fire growth pulses from these trees. Dated basal fire scars from a live regrowth tree is illustrated (Figure 4). The tree ring index values and fire record for one tree as an example is illustrated (Figure 5).

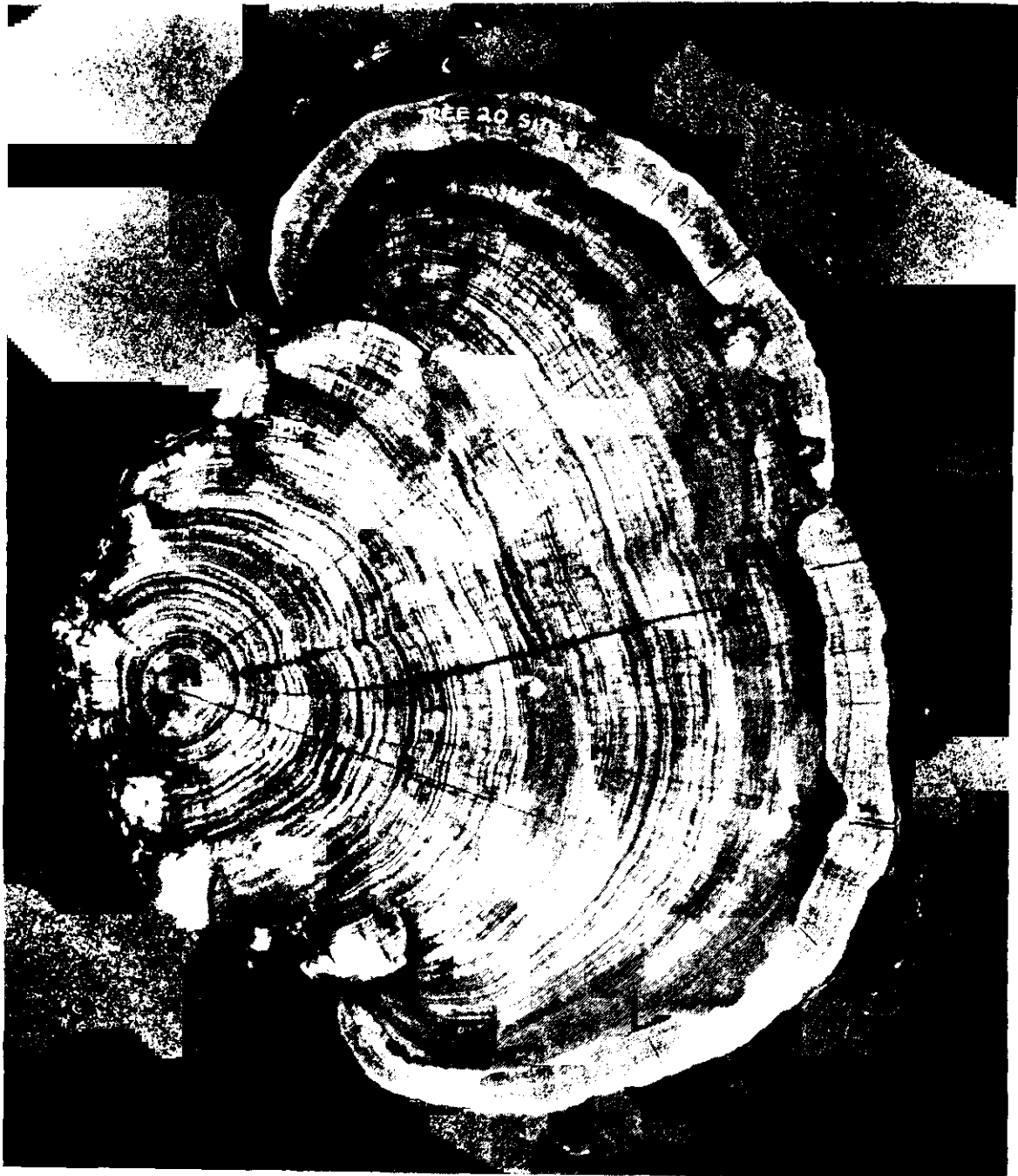


Figure 4 Basal growth ring cross section of live old growth woodland tree 20, revealing 6 fire scars which are indicated by a white marker and fire date. After each fire burnt and damaged the tree on its left side, lobate callus wood was produced in an attempt to heal over the wound. Note symmetric growth and relatively wide distinct growth rings. Radial lines indicate transects of photo enlargements used for tree ring identification and cross dating. Magnification $\times 0.43$.

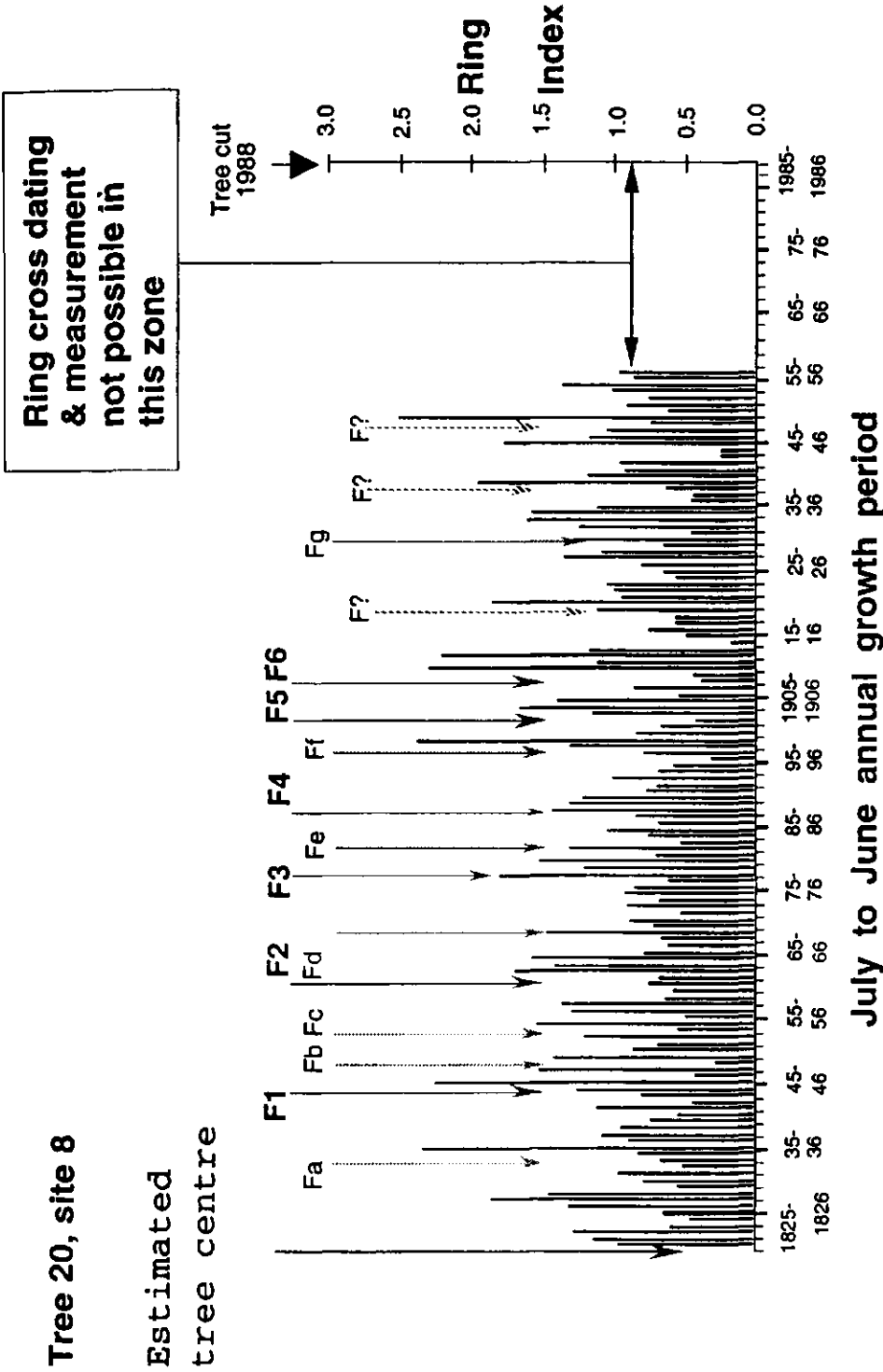


Figure 5 The fire record for tree 20, from a site (8) near Willis, interpreted from fire scars recorded within the tree (F1...F6), and from inferred post-fire growth pulses (Fa...Fg). These coincide with fire scars in other cross dated trees. Possible additional fire growth pulses not confirmed by a fire scar are indicated F?

The combined record from official records and tree ring dating shows that after an apparently long quiescent period regular fires occurred about every six (range 3 - 11) years soon after the entry of Europeans and their grazing animals into the valley in the 1840s until about 1900, the time when the first rabbits are reported in local newspapers (Figure 6). This fire interval is not unexpected as in this dry valley the accumulation of fuels is slow compared to the higher rainfall areas of Kosciusko National Park such as snow gum forest which was capable of sustaining a fire every two to three years (Banks 1989). The results also show a decline in fire frequency after about 1910 with an even further decline since 1940. By this time the full impact of rabbits and cattle and competition from the young white cypress pine regrowth were collectively allowing only minimal litter build up to occur. From 1940 onwards fires became most uncommon occurring most probably as small patch burns rather than major crown fires over large areas, for example two large fires occurred in 1972 and 1988 which tended to self extinguish or burn in a patchy mosaic as they advanced into the lower elevation white cypress pine stands.

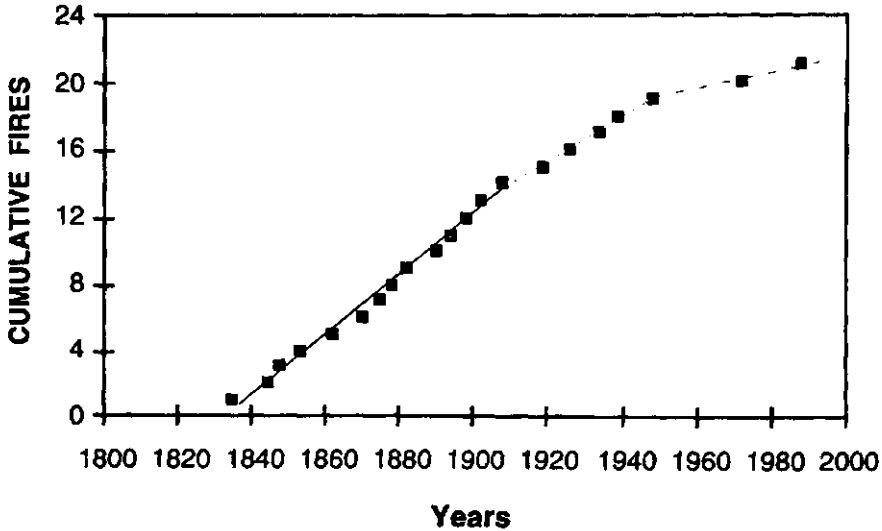


Figure 6 Cumulative occurrence of fires in study area. Lines of best fit have been superimposed to aid interpretation of possible trends in fire frequency. The lines are hand fitted lines of best fit for the period 1830 to 1940 based on fire scar and inferred fires from post-fire growth ring patterns. There appears to be a decrease in cumulative fire frequency after about 1910 (dotted line) and a further decrease after c1940 (dashed line). The last 2 fires are from historical records of fires in the study area (dashed line).

With this history of numerous fires in the valley it is surprising that so many of the old growth trees survived and still others persist as dead stags to this day, given the sensitivity of this species to fire damage and the ease with which the resinous timber burns. Over time white cypress pine trees progressively increase their bark thickness which, although deeply furrowed, insulates the butt of mature trees from the damaging effects of all but the more intense surface fires as may occur if a burning log lays against the tree. The existing old growth trees with intact bark, and that is the majority, show little evidence of fire damage and scarring, indicating a history of mild surface fires about these trees. The only trees to carry fire scars are those in vulnerable sites such as steep slopes where fuels accumulate on the upslope side of the butt, moreover, they need to be fire scarred when young and once scarred the protective bark layer is lost and takes several decades to recover, exposing the scarred face to additional fire damage. Thus a tree fire scarred early in its life remains sensitive to subsequent fires. Intensive field inspection showed less than one third of old growth and no regrowth trees to be fire scarred and there is no evidence of surface charring on the bark to suggest a crown fire. This now raises the question as to what did bring about the last major tree loss about the 1940s. Closer inspection of the inner bark of many of these trees helps to provide a possible answer to this perplexing question, for on the inside of the bark lies the evidence of the activity of large numbers of insect larvae which have eaten out the phloem tissue girdling the trunk. From the numerous larval tunnels on the inner bark it seems that this is what killed off most of the last survivors of the old growth forest. With respect to the white box, continued surface fires no doubt eliminated some trees but the site of these can be identified since even in old age the species readily sprouts from the base so that a clump of small diameter stems assures the position of an old growth rootstock.

History of changes to the forest

The outline so far has shown that major changes have taken place in this valley's forests since the arrival of the first graziers and we can now begin to put together the first environmental history for the area. A synthesis of the anthropogenic and environmental factors leading to changes in forest structure was compiled in a diagram to aid interpretation (Figure 7). There are two cultural eras to consider, the Aboriginal and the European. There appears to have been very little overlap of these cultures and we can assume that the Aboriginal land management, whether passive or active, came to a sudden halt when the graziers occupied the valley.

During the Aboriginal period, which persisted for at least 17,000 years (Flood 1980), and into the early grazing period, the vegetation of the Snowy River Valley was predominantly woodland comprising scattered individual trees and clumps of large white cypress pine trees, confined largely to the hot and drier

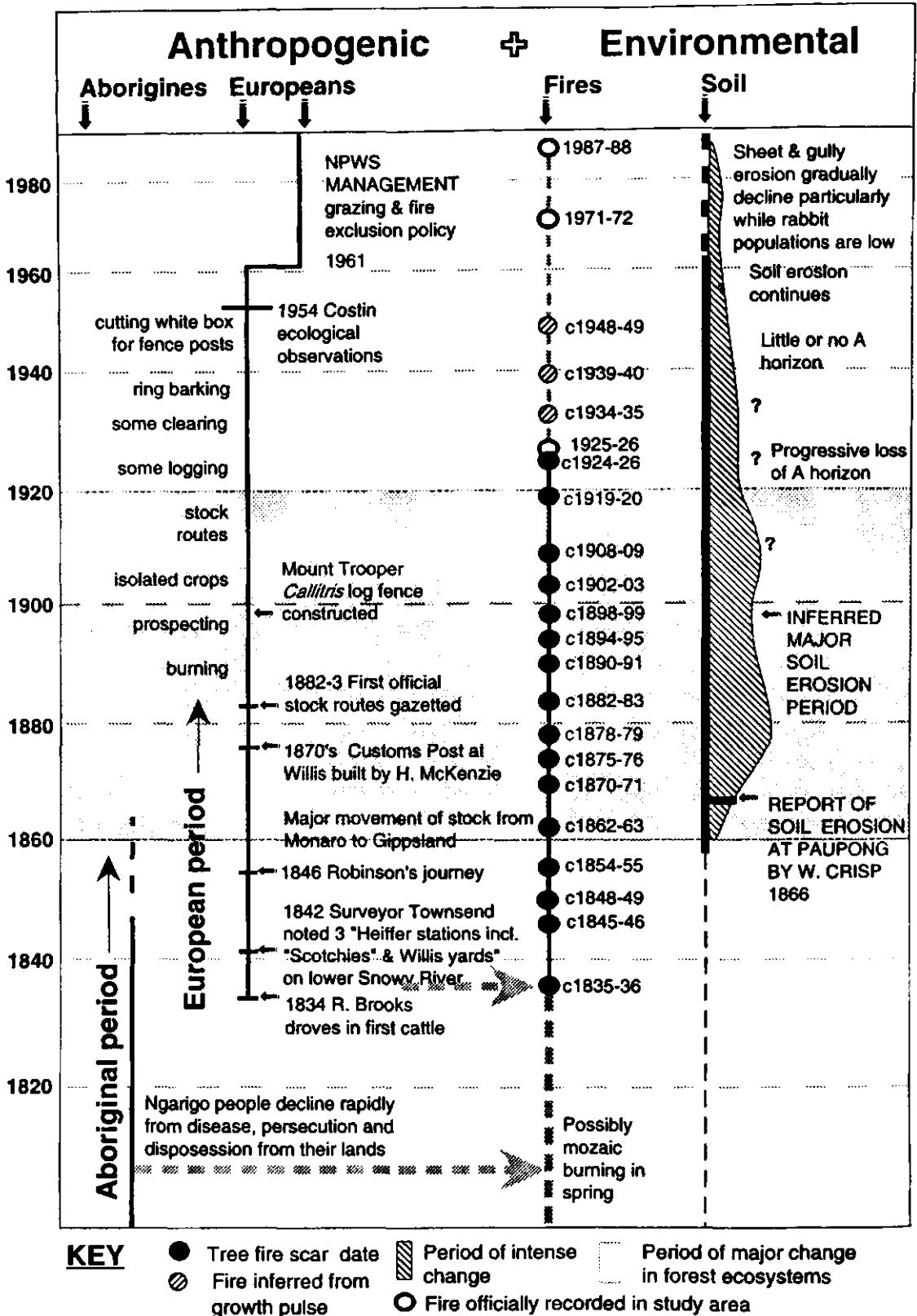
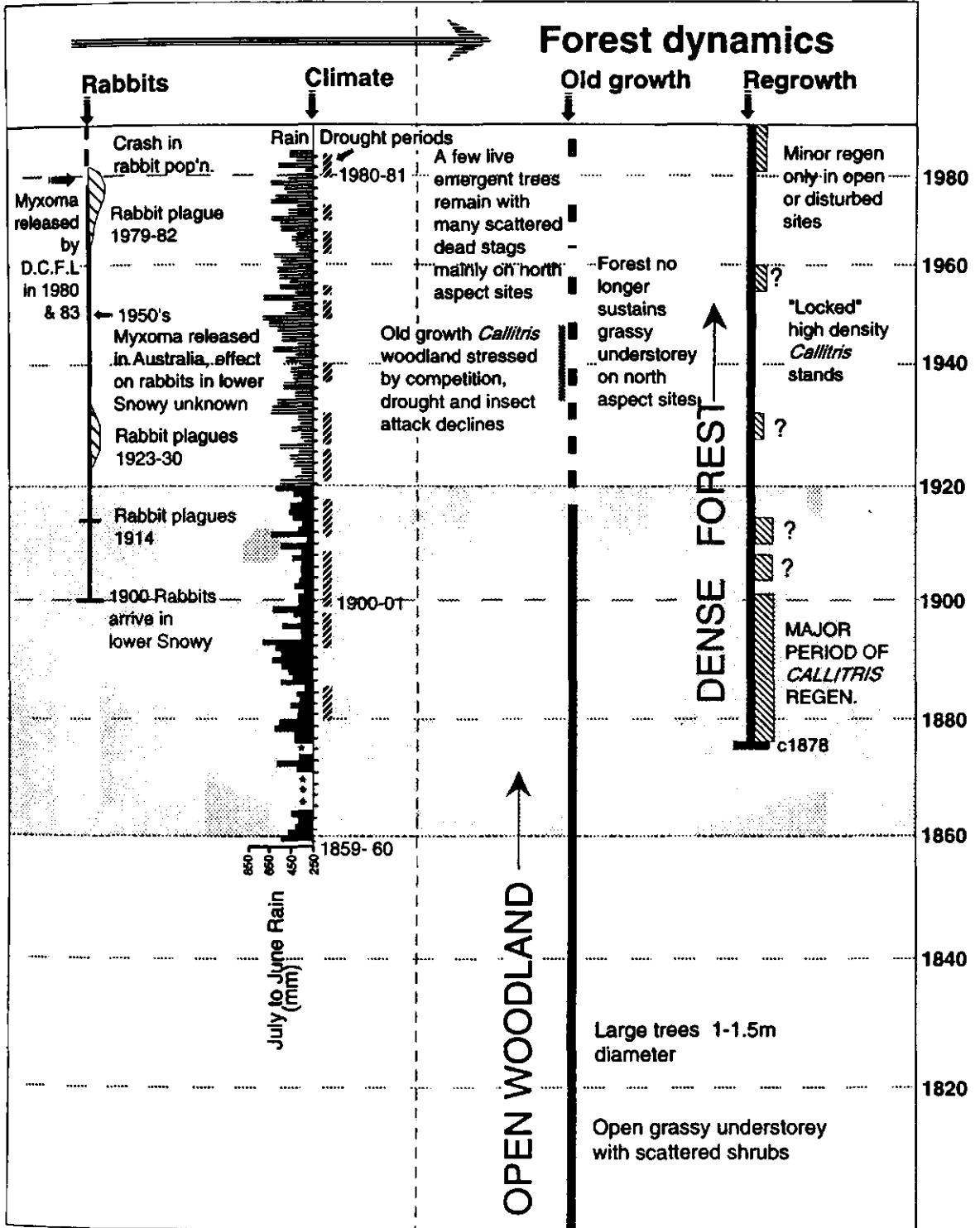


Figure 7 Timeline of environmental and anthropogenic factors which contributed to changes in the structure of the white cypress pine forests of the lower Snowy River area. Fire dates indicated are for the July to June growth/fire seasons.



Recorded rain at Cooma (Lambie St.)
 Predicted rain for Suggan Buggan
 Periods of drought
 Missing record

north slopes and ridges where this species had a competitive advantage over the eucalypt, with the white box dominating the cooler moist south facing slopes. On intermediate sites these two species occurred in mixed stands. The white cypress pine stands would have been multi-aged, although individual groups of trees may have comprised one to a few tree ages. These stands were probably dominated by old rather than young trees. The understorey was composed of predominantly dense grasses (*Themeda australis*, *Poa* spp. and *Stipa* spp.) and forbs with scattered shrubs (*Acacia* spp., *Lissanthe strigosa*) providing a protective cover to well developed but shallow stony soils. The chief grazing animals were kangaroos and wombats. As to the fire regime we can only speculate that it must have been benign, removing litter, stimulating plant growth but inflicting little damage upon the tree strata.

The European era is one of changing land use and impacts on the valley landscape. It is best interpreted by dividing the European era into five periods each corresponding with a distinct but overlapping land use phase in the valley. The first period started in 1834 when the first Europeans entered the valley with their grazing animals taking up 'runs'. They quickly displaced the Aboriginal people. The graziers set about utilising the native pastures and following practices brought from England such as burning the unpalatable low vegetation to encourage new succulent pasturage. The valley also became a major access route for stock moving to and from the coast and the tablelands and mountains beyond. A colonial border post was based at the southern end to collect taxes imposed on travelling stock. The onset of grazing, trampling and regular burning in an already fragile environment saw the loss of ground cover vegetation and the start of erosion which stripped off the nutrient-rich top soil and exacerbated stress on the trees in times of environmental stress.

The second period 1870-1900, saw a wave of major white cypress pine regeneration. In the late 1870s a series of good rainfall years, combined with the continuing disturbance to the landscape from erosion and fires, produced the conditions which triggered large scale 'wheatfield' regeneration which also occurred in white cypress pine west of the Great Dividing Range (Lacey 1972). Gaps in fire and grazing intensity and the availability of seed and suitable weather conditions allowed waves of regrowth to establish. Age estimates from regrowth stands indicated a major tree establishment period from about 1885 to 1900.

The third period 1900-1940, was characterised by the arrival of rabbits, a decline in the productivity of the area for grazing, a decline in fire frequency, and decline of the old growth trees. Rabbits arrived in the area in 1900 and were the final major factor which contributed to changes in forest structure. The combined effect of rabbit and cattle browsing of white cypress pine is well documented (Johnston 1969; Lacey 1972; Lindsay 1948) and together would

have effectively prevented further regeneration of white cypress pine in many areas. A second but smaller erosion phase was triggered by intense rabbit grazing. Fire was still used extensively during the hottest summer and the autumn months throughout these stands and forests of eastern Australia but anecdotal evidence and official records reveal that there were now few major fires possibly due to low fuel levels. This evidence was substantiated in this study and others (Banks 1982; 1987; 1989; Pryor 1939; Raeder-Roitzsch and Phillips 1958) by dendrochronological evidence.

Rabbits were not the only invaders. Throughout the era introduced plants steadily established themselves particularly in the more disturbed sites such as along the valley floor. At least 210 species are likely to occur in the valley (J. Mallen Cooper pers. comm.). Other feral animals such as red deer (*Cervus elaphus*), fallow deer (*Dama dama*), sambar deer (*Cervus unicolor*, wild dogs, horses, goats, cats and foxes are also present in variable numbers. Toward the end of this period saw the decline and mortality of the old growth white cypress pine trees. By 1935-1945 severe drought combined with intense competition from regrowth caused severe stress in the old growth trees which had established in more open stand conditions. The old growth trees were then subject to massive insect attack probably by larvae in the family Buprestidae (M. Tanton pers. comm.) such as the cypress pine jewel beetle (*Diadoxus erythrurus*) which is reported to attack fire damaged *Callitris* spp. (Hadlington and Gardner 1959). Girdling of the trunks of every one of the dead trees strongly suggested that this was the final cause of mortality.

During the fourth period from 1940 to 1961 the importance of the area for grazing was diminishing. Some timber cutting occurred and fires were now infrequent to rare due to low fuel levels on bare eroding soil surfaces. The dense locked regrowth stands permitted little pine recruitment.

The final period from 1961 to 1990 is the period of management by the NSW National Parks and Wildlife Service. Grazing was prohibited west of the Snowy River in 1961 and in the whole area by 1971. Occasional illegal grazing activities have occurred. The rabbit plagues of 1979-83 were reduced by a *Myxoma* epidemic which was released downstream of the study area by the Victorian Department of Conservation Forests and Lands in 1983 (Smith 1986). Since about 1983 rabbit populations have remained at a low level. Due to the long period without fires combined with a low rabbit population and a succession of good seasons, relatively dense grass cover has developed in some areas where it has not been seen for decades. New white cypress pine seedlings have appeared in disturbed sites and on the less densely populated cooler south aspect sites with a dense grassy ground cover. Two major wild fires in separate parts of the valley have occurred resulting in mostly low intensity fire in the pine stands causing patchy mortality.

Conclusion

Over the last 150 years the white cypress pine forests of the Snowy River Valley have responded to forest disturbances by developing extensive dense regrowth stands throughout the white cypress pine zone. These changes are likely to have been more dramatic during this period than at any time during the Aboriginal era, and are almost entirely due to European land use practices. This response of the vegetation is analogous structurally to the response of the snow gum forests examined by Banks (1982) and other montane forests in the Australian Alps which were exposed to similar land use practices. The major shift in forest structure was from open woodland to dense locked regrowth stands with a sparse understorey and bare eroding soils on the steeper north aspect sites. The loss of the A horizon and the store of organic matter and nutrients in the upper soil profile has reduced the productivity of much of the area. Erosion continues to be a problem since parts of the area are so degraded and periodically grazed by rabbits that they no longer support reasonable levels of ground cover vegetation.

The white cypress pine forests will remain in a highly altered state for a very long period due to the inherent ability of this species to sustain itself in locked stands with little or no growth. Forest disturbances such as wind, insect attack and occasional fires will slowly open up the stands permitting gradual dominance by individuals. These dense stands will remain for decades at risk to extreme wildfires which have the potential to eliminate them over large areas as very few seed bearing trees exist. This study has provided evidence for the anthropogenic and environmental factors and their interactions which caused the changes in the white cypress pine forest ecosystem and has reconstructed the environmental history of the forest. The manager is now in a position to develop socially and environmentally responsible policies for future management of these forests which were acquired for nature conservation purposes.

Note

This paper contains material which also appears in Pulsford, I.F., Banks J.C.G. and Hodges, S.L. 1992. Environmental history: an example from the white cypress pine forests in the Australian Alps. In: Grenier, P. and Good, R.b. (eds) *Les Alpes Austaliennse Review De Geographie Alpine*, Institut de Geographie Alpine, Tome LXXX No 2-3: 65-95.

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CHAPTER 8

ENVIRONMENTAL HISTORY OF WARATAH CREEK CATCHMENT, COOLANGUBRA STATE FOREST, NEW SOUTH WALES.

Angela Rymer

Introduction

During the past twenty years, public interest in environmental management practices in Australia has increased substantially. This has been due in part to an increase in awareness of the role past European land use practices have had in the process of environmental degradation affecting much of the continent, which has resulted in the desire to conserve and protect remaining natural resources. Recher (1984) has described the expression of this interest with regard to the native forests of Australia as follows:

As Australia entered the 1970s more than half of its original forests had been cleared for agriculture and relatively little was reserved as national park or nature reserve. To conservationists the advent of woodchipping, the clearing of native forest for pine plantations, and logging of rainforest spelled the end of those forests that remained. As a result conservationists began a vigorous campaign to protect forests from intensive harvesting or conversion to plantations, agitating to reserve large areas as parks. (Recher 1984: p.152).

Concern has been raised about the effects of harvesting the native forests of the south-east region of New South Wales since the commencement of the woodchip industry in the late 1960s and early 1970s. Within the scientific community, concern focuses on the impacts of practices such as clearfelling and associated forestry operations upon the ecological processes of forests, and the extent to which this intensive use of the forest is sustainable. It has been argued that:

to satisfy the objective of sustainable development of Australia's native forests, the scientific knowledge of ecological processes in forests, and forest and wildlife ecology, must be raised above that presently available' (Lacey *et al* 1990: p. v).

This sentiment is echoed by many within the scientific community involved in management based research (for example: Hopkins *et al* 1990; Keith and Sanders 1990; Preece 1990; Norton *et al* 1991), and a number of authors (Chappell, 1985; Wasson and Clark 1985; Lunney and Moon 1988; Gell and Stuart 1989; Clark 1990) have advocated the use of research techniques based upon a historical approach to contribute to an increase in the level of scientific knowledge of ecological processes in forests.

Clark (1990) has argued for the need for present day environmental management to be based on an understanding of ecological patterns and processes, both in the present, and in the past leading up to the present. This is necessary if predictions of the outcomes of management actions are to be based on a sound understanding of the complex interactions over time between processes and the patterns they create. Traditional ecological methods, such as monitoring, observation and experiment are valuable in providing information about the composition of present ecosystems in terms of patterns and processes, and the responses of ecosystems to short term perturbations. These methods of study however, are inadequate 'for detecting longer-term trends and understanding rates, directions and magnitudes of change in complex and dynamic systems' (Clark 1990: p. 1). Palaeo-ecological methods are useful for understanding longer term dynamics such as climatic change. However, Clark argues that a gap exists, in terms of time span covered, between these two methods of study of environmental change and environmental dynamics, and that this gap is at 'just the timespan covered by the most intensive recent human impact worldwide' (Clark 1990: p. 6). Clark concludes that, 'the method of study needed, then, is historical ecology, reconstructing the history of the environment on a time scale of years to centuries with appropriate resolution' (Clark 1990: p. 6).

Types of evidence which can be utilised to reconstruct the history of the environment include: written and oral records, such as archival material, contemporary written records and oral evidence; instrumental records, for example, climatic and hydrological variables; and the record contained or preserved within the present physical environment, for example, fire scars embedded in tree boles, accumulated sediments or peats in lakes, bogs or swamps, and archaeological sites (Clark 1990).

This paper is based upon a study conducted into the environmental history of a small catchment in Coolangubra State Forest, south-east New South Wales (Rymer 1991). The broad aim of that study was to contribute to an understanding of the historical ecology of the forests of south-east New South Wales. A small area within the forests was chosen as the focus for a study which would investigate written and oral records in order to recreate the history of human occupation and land use, and thus of human disturbance and management of the

forest over a time scale of the last 150-200 years. However, it was beyond the scope of this study to recreate ecological 'states' at various times throughout the area's history to use in assessing the impacts of changes in land use and management upon ecological processes and patterns over this period of time.

The investigation of the history of human occupation and land use for the study area was based upon research of archival, documentary and oral sources. A dendrochronological study was also conducted with the aim of investigating the exact age of the apparently even-aged stand located within the study area. However, the results of this part of the study are not discussed in this paper.

The sources of information searched, and types of information revealed by those sources are summarised in Table 1. Research of primary sources concentrated

Table 1: Archival, documentary and oral sources of information

Source	Type of information
Parish and County Maps.	Pattern of land alienation over time, location of reserved crown land, location of transport routes.
Portion Plans - Surveyed Plans of Alienated Crown Land.	Details of initial land tenure, dates of occupation. Nature of vegetation, soils, geological formations, built structures.
19th Century Surveyors Records - Plans and Field Books.	General descriptions of land and timber, pastoral property locations, track locations.
Government Gazettes - Register of official and legal transactions with regard to land.	Dates of land transactions, descriptions of land boundaries, size and location, names of owners and users.
Forestry Commission of NSW records - Estates Branch Files.	History of dedication and revocation of reserves. Record of use of reserve by lessees, silvicultural improvements, summaries of reports on timber. Maps of reserve and forest boundaries.
Archived Lands Department Records - Indexes, Registers and Copies of Correspondence.	Surveyors descriptions of use and condition of reserves, recommendations for future use. Files relating to conditions of grazing leases.
Current or recent Governmental records and reports - Management Plans, Environmental Impact Statements.	Current land use and generalised recent past land use.
Interviews/Oral History - Personal Recollections (Forestry Commission District Office; Local Residents).	Recent history, location information regarding land use in recent history.
Secondary and Contemporary Sources - Local Histories, Contemporary Accounts.	Land use practices.

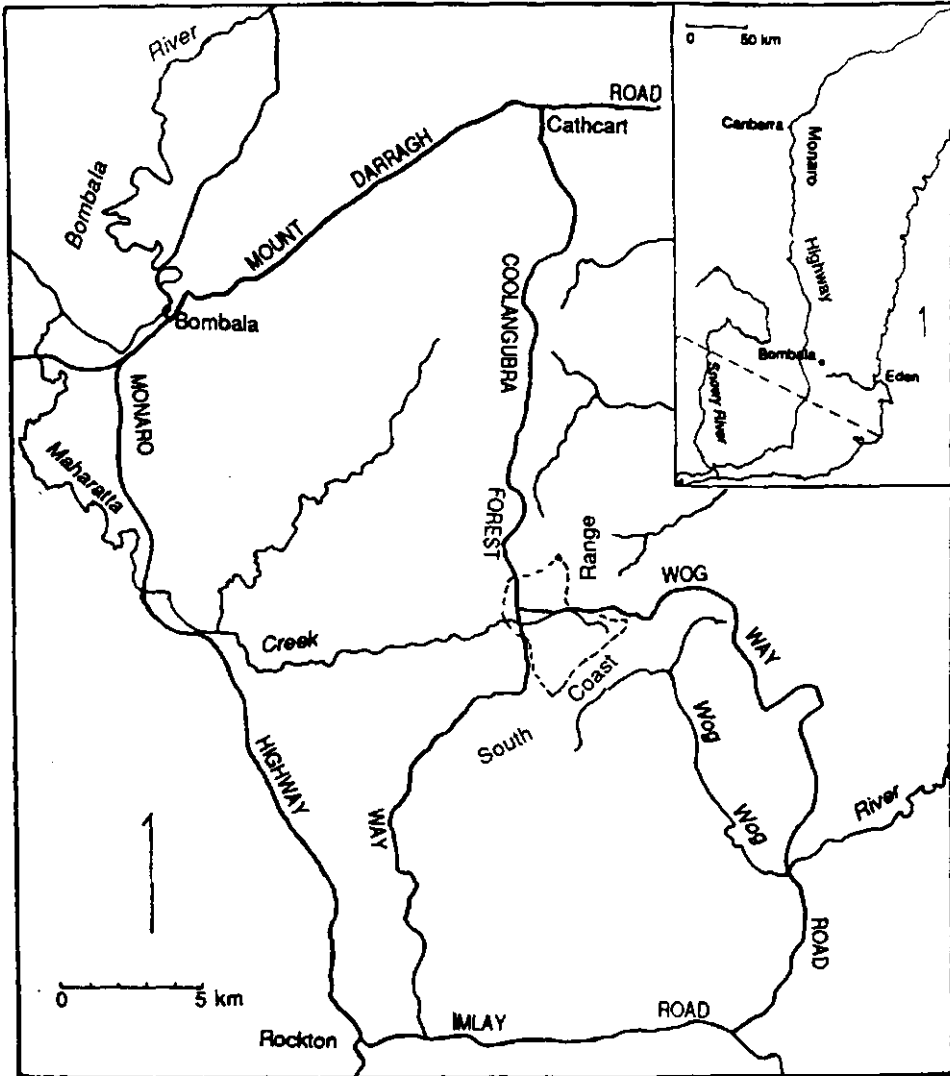
upon searches of government archives and cadastral records (Parish and County Maps and Portion Plans). Archival material relevant to the catchment area derived mostly from the period before 1917. Consequently, the amount of material gathered relating to the period covered by the timespan 1830 - 1916 was much greater than that gathered for the period since 1916.

The area chosen was the Waratah Creek catchment area, located within Coolangubra State Forest, approximately 18 kilometres south-east of Bombala. This area was chosen as a site for investigation because of the existence of a theory that an apparently even-aged stand within the area marked the site of previous extensive human disturbance, possibly through clearing for grazing purposes, that had occurred at some time late last century. This theory provided a particular problem around which to base investigations, and indicated that the area may have had the potential for yielding some information specific to that locality regarding past human occupation, land use and disturbance. The catchment area was chosen as a convenient ecological boundary for focusing the study, but the investigation was not strictly confined to the catchment area, as it was thought that its history could only be correctly interpreted within the context of the history of the surrounding area.

The study area

The Waratah Creek catchment area is located at the edge of the southern part of the Monaro Tablelands between the undulating grazing land of the tablelands to the west, and the dissected forested hills and ranges extending easterly to the coast (Figure 1). The catchment is bounded on the north, east and south by the South Coast Range. Waratah Creek itself flows westerly into Killarney Swamp, forming, together with Burrimbucco Creek, the headwaters of the Maharatta (or Saucy) Creek which eventually drains into the Bombala River. The topography of the catchment is shown in Figure 2, and is characterised by gentle and undulating slopes in the western part of the catchment, and steeper slopes rising in the east to peaks in the South Coast Range.

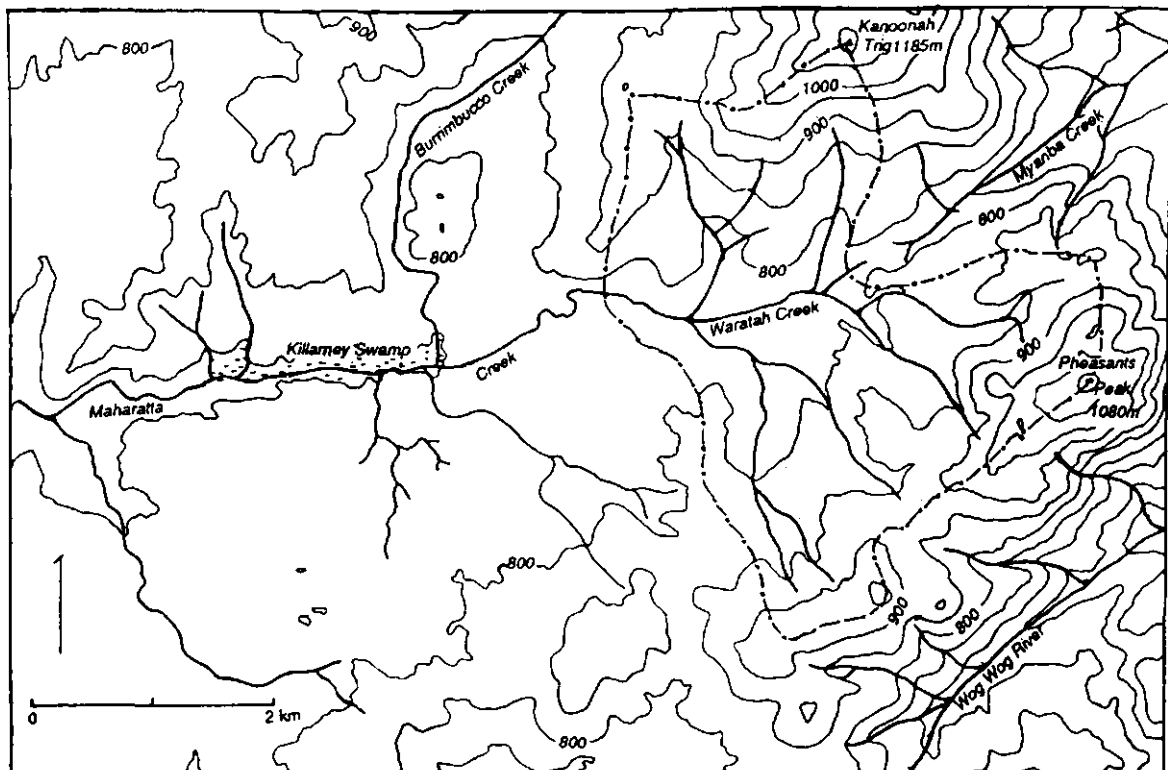
The forest vegetation within the catchment area includes structural formations within the categories Tall Open Forest and Open Forest (Specht 1970; Forestry Commission of NSW 1986). The catchment area is dominated by wet sclerophyll forest comprising the following species: *Eucalyptus radiata* (narrow leaved peppermint); *E. obliqua* (messmate); *E. cypellocarpa* (mountain grey gum or monkey gum); *E. viminalis* (manna gum); and, *E. fastigata* (brown barrel). Stands of dry sclerophyll forest occur on the ridge tops in the east of the catchment composed of *E. sieberi* (silvertop ash) and occasional patches of *E. fraxinoides* (white ash). Swamp communities with an overstorey of *E. ovata* (swamp gum) occur around creeks and drainage lines in areas of impeded drainage. Understorey tree species within the wet sclerophyll forest include



Key - - - - - Waratah Creek Catchment Area

Figure 1 Location of Study Area.

Acacia dealbata (silver wattle) and *Bedfordia arborescens* (blanket bush). The ground cover is ferny with *Pteridium esculentum* (bracken fern) being very common throughout the catchment area, and *Dicksonia antarctica* (tree fern) occurring in wetter gullies.



Key - - - - - Waratah Creek Catchment Area
 - 800 - Contours (50m intervals)

Figure 2 Topography - Waratah Creek Catchment Area.

In terms of present land use, the catchment area is located within Coolangubra State Forest in the Southern Management Region of the Forestry Commission of NSW. Coolangubra State Forest falls within the supply area for the Harris Daishowa woodchip mill at Eden, and is zoned according to a Preferred Management Priority (PMP) classification system (Forestry Commission of NSW 1988). The catchment area has been classified into two different zones under this system. The area to the south of Wog Way Road was gazetted as Waratah Creek Flora Reserve (PMP Category 1.3 Preserved Natural Forest) under the Native Forest Preservation programme in 1989. The rest of the catchment has been classified as Category 1.1 Multiple Use Natural Forest, which includes areas classified into sub-categories of General Use, Visual Resource Protection, and Flora and Fauna Protection.

Evidence

This section outlines the evidence gathered relating to patterns of human occupation and land use within the study area. The section is divided into five parts corresponding with time periods dominated by different forms of occupation and land use in the area.

Prehistoric period

The prehistoric period was looked at briefly by reviewing the available literature relating to prehistoric Aboriginal occupation of south-eastern New South Wales. Due to the difficulty of finding archaeological sites in areas of dense vegetation growth such as the wet forests of the region, extensive work focusing on the prehistory of the forests of south-eastern New South Wales has only begun recently (as outlined in Feary 1988). It is therefore still difficult to build a clear picture about the nature of pre-European occupation and use of the region by Aboriginal people.

Of the prehistoric archaeological work which has been done in this area, some artefact scatter sites have been found within the Waratah Creek catchment area (Packard, pers. comm.), and a number of archaeological sites have been found in the surrounds of Killarney Swamp (Shawcrosss 1982). However, it is thought that the diversity and abundance of flora and fauna within the catchment would be likely to have supported frequent usage by Aboriginal people (Forestry Commission of NSW 1989b).

Pastoralism, 1830-1871

European occupation of the southern Monaro region began in the late 1820s, with the occupation of runs by squatters seeking new land on which to graze increasing numbers of cattle and sheep. Details about the acquisition of land and subsequent changes in land occupation by the squatters (or pastoralists as they later became known) are reported and discussed in Hancock (1972), Kay Donald (1985), and Schofield (1990).

Schofield reports that a William Klensendorlfe occupied land from Cootalmyong (just east of present day Bombala) to Mila Bog (south of Bombala), from the late 1820s. In 1839 the Commissioner of Crown Lands for the Monaro district (a government official appointed to safeguard government interests in areas outside the 'settled districts' near Sydney) conducted a tour of southern Monaro, visiting all the stations and recording details of ownership, boundaries, and numbers of stock and resident workers. He recorded that the lands taken up by Klensendorlfe were known as 'Maharatta' and had been divided into two different portions, the northern portion covering an area of 24 square miles, and the southern portion 20 square miles. Maharatta ran cattle and sheep.

Boundaries of runs were not defined by fences, but by agreement or negotiation between neighbouring squatters. Descriptions of the boundaries were from time to time recorded by the Commissioner for Crown Lands. Schofield (1990) has attempted a reconstruction of the approximate location of pastoral runs in 1839 using the boundary descriptions recorded by the Commissioner for Crown Lands. Based on this reconstruction, Maharatta was located south of the Coolumbooka and Bombala Rivers, north of Boggy Creek, east of Aston run, and west of the South Coast Range. The area was based around Maharatta Creek, and included its headwaters, that is, Waratah Creek and its catchment area.

Some idea of the situation of the Aboriginal occupants in the area during the period of initial European occupation can be gained from a letter sent to the Colonial Secretary from the Commissioner for Crown Lands for the Monaro district in 1842. The Commissioner for Crown Lands for the Maneroo District reported that:

The Aborigines of the District , with the exception of the Coast Tribes, may be said to be almost in their primitive state. The natives belonging to the tribes to the westward of the Coast Range are very little employed by the Stockowners, except for a few occasionally in washing sheep, they pursue their original habits of hunting; and are constantly moving from place to place. (Letter to Colonial Secretary, 14 January 1842. Mitchell Library Microfilm A 1227, p.1096).

The Commissioner for Crown Lands had also conducted a census of the population of Aboriginal people in the district, according to pastoral property boundaries. This census indicated that the population of Aborigines on the Maharatta property in 1841 totalled 45 people. However, Schofield reports that numbers of Aboriginal people in the Monaro region were soon reduced following European occupation, both through violent clashes with stockmen, and through the introduction of smallpox into Aboriginal communities (Schofield 1990).

Due to boundary disputes, and changes in the squatters fortunes, the boundaries of squatters' runs were liable to change considerably over the years. Hancock (1972) has recreated the boundaries of the runs as they were in 1848, based upon the descriptions of run boundaries as they appear in a series of lease claims published in the *Government Gazette* of September 29, 1848. At this time, the Maharatta run had been divided into three separate runs; Bald Hills Station, Maharatta, and Mila or Boggy Creek. From this reconstruction, it appears that the southern boundary of Bald Hills Station run and the northern boundary of the Maharatta run occur in the region of Killarney Swamp, with Waratah Creek most likely falling into Bald Hills Station run.

Depending on the size of the property, pastoral runs often had both a main settlement called the head station, and several outstations located some distance from the head station. The head station would comprise a homestead and other major buildings and yards, whereas the outstations may have only comprised a hut for shepherds, and some moveable yards. The head stations were connected to their outstations and other settlements by a network of tracks for bullock driven carts or horses. The details of this infrastructure associated with the Maharatta station are recorded in plans made after a number of surveys of the ranges and stations within the Monaro district by Surveyors Townsend and MacCabe in 1846 and 1847. The locations of Maharatta, and two of its outstations are recorded, as well as a peak on the South Coast Range named 'Coolangubra'. By using the rivers mapped on these plans as reference points, the position of the infrastructure associated with Maharatta run can be located in terms of present geographic locations (refer Figures 1 and 2). Maharatta head station was located on the Maharatta Creek near its junction with the Bombala River. An outstation named 'Gulgin' was located approximately eight kilometres further south, near where the Monaro Highway crosses the Maharatta Creek, and an outstation named 'Burrimbucco' was located to the east of 'Gulgin' in the vicinity of Killarney Swamp, on a small tributary of the Maharatta Creek. The peak on the South Coast Range named 'Coolangubra' in 1847 corresponds with that named Pheasants Peak today, on the eastern boundary of the Waratah Creek catchment area.

In addition to these features, a track is marked on the surveyors' plans of 1847, and those from a later date, connecting Maharatta, Gulgin and Burrimbucco, and continuing east through the Waratah Creek catchment area, crossing the South Coast Range to the southwest of 'Coolangubra' (Pheasants Peak). The track is shown following the course of the Wog Wog River, and the Towamba River until it reaches Boyd Town on Twofold Bay.

Until 1846 the grazing and occupation rights upon the pastoral properties described above were based on a payment to the crown of an annual licence fee for the right to depasture stock on crown land (Jeans 1972). From 1846 until 1861 it was possible for pastoralists to obtain leases of crown land for a period of eight years, and to purchase land where improvements had been made, up to an area of one square mile in twenty five. The passage of the Crown Lands Alienation Act and the Crown Lands Occupation Act in 1861, which enabled the selection of portions of crown land from 40 to 320 acres by any individual, regardless of whether it was already leased by a pastoralist, brought substantial changes to the pattern of land occupation throughout the State. The changes that took place in the Waratah Creek area of Maharatta and Bald Hills Station as a result of these Acts are outlined in the following section.

Selection and reservation, 1872-1916

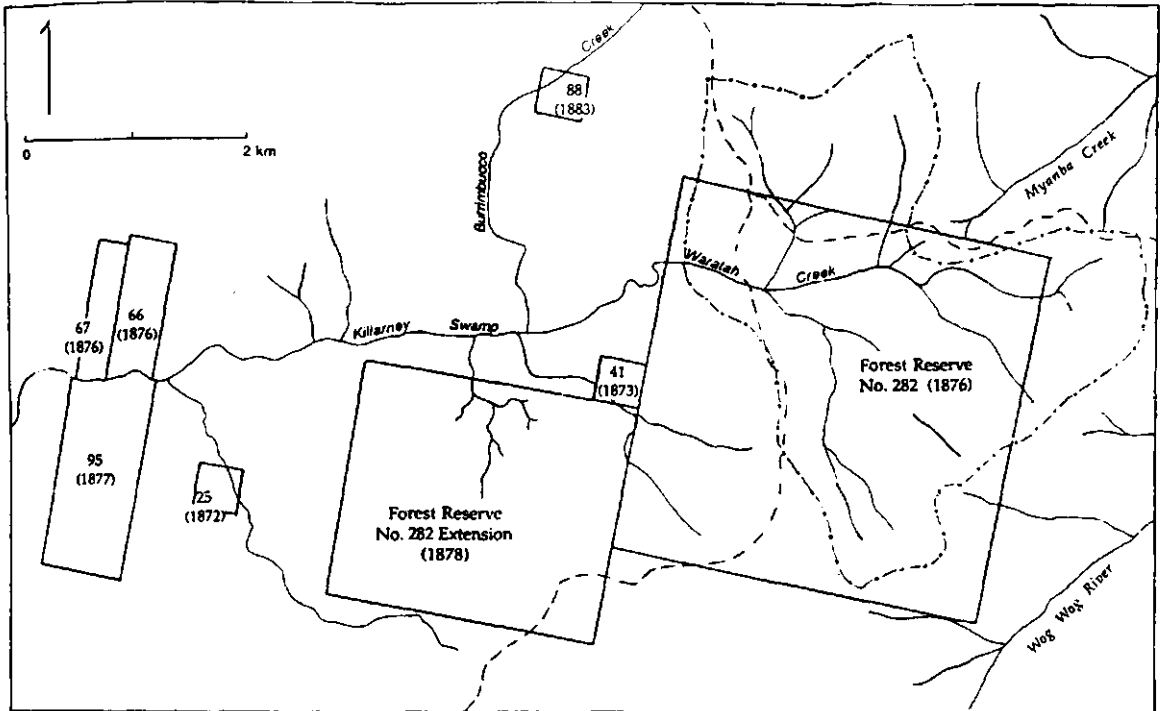
Portions of land taken up under the Crown Lands Acts of 1861, either by auction or selection, were eventually surveyed by licensed surveyors, with the plans being lodged with the Surveyor General's Department. Early plans contained only basic boundary information, but after 1864 included details about natural and artificial features, including improvements to the land such as fences, buildings and yards, any areas of ringbarking, and descriptions of vegetation and geology. The original plans can be viewed in the Plans Record Room at the Department of Conservation and Land Management, in Sydney.

The first portions of land selected from the Maharatta and Bald Hills Station runs in the vicinity of the Waratah Creek catchment area, under the Crown Lands Alienation Act of 1861, were Portion 25 in 1872, followed by Portion 41 in 1873. In January 1876, a reserve for the preservation and growth of timber was declared under the Crown Lands Alienation Act of 1861, on four square miles (1036 hectares) of land adjacent to the eastern side of Portion 41. In January 1878, the reserve was extended by a two and a quarter square mile (580 hectares) area abutting the south western edge of the reserve.

The reserve was called Forest Reserve No. 282, and its position was marked on the plan for Portion 41, which was surveyed in October 1875. The boundaries of the reserve were also marked upon the 2nd Editions of the County of Wellesley and County of Auckland Maps issued in 1877, which were based upon the surveys of the area undertaken by Surveyor MacCabe and Townsend in 1846 and 1847. The boundary of the reserve as shown on the County Maps appears to encompass much of the area forming the headwaters of the Maharatta Creek. Portion 41 is also shown on the County Maps, and, as Forest Reserve 282 is accurately surveyed in relationship to Portion 41, it is possible to define the position of the reserve upon a modern topographic map (which includes cadastral information such as portion locations).

Figure 3 details the results of this process, and the pattern of land alienation in the vicinity of the catchment area during the period 1871-1883. The positions of the modern roads Coolangubra Forest Way, running approximately north-south, and Wog Way Road, running approximately west-east from Coolangubra Forest Way, are indicated for reference. As shown, Forest Reserve No. 282 did indeed encompass much of the Waratah Creek catchment area.

From 1876 until 1916, Forest Reserve No. 282 and its extension were subject to a number of reviews regarding their continued suitability as forest reserves, resulting in a number of boundary alterations as outlined below. These reviews and details about them were revealed in a number of sources, including letters from surveyors accompanying surveyed plans sent to the Surveyor General's Office, at present located in the collection of the Archives Authority of NSW.



- Key: Waratah Creek Catchment Area
 ----- Modern Roads (Coolangubra Forest Way N/S,
 Wog Way Road E/W)
 41 (1873) - Portion Number (date of selection)

Figure 3 Land Tenure 1871-1883.

The surveyors' letters are particularly interesting as they often included an assessment of the quality of the timber in the reserve and details about cutting or milling of timber that had taken place within it.

In March 1884, in conjunction with a survey of Portion 88, Surveyor Hungerford from the Land District of Bombala conducted a review of the boundaries of Forest Reserve 282 and its western extension, with the aim of cutting out the land no longer suitable as a forest reserve, and making the county boundary (following the South Coast Range) the common boundary between both of them. In a letter detailing his actions in this regard, Surveyor Hungerford states that:

Reserve No. 282 contains a vast quantity of good timber. Mountain Ash, Messmate, Gum and Peppermint. The West Extension also contains fair timber but is more scrubby.

I modified the north boundary of the West Extension by marking the line 26 chs [chains] 59 links south of its notified position, leaving out a strip of land quite worthless as a timber reserve, as it consists of very light gum and sallee country interspersed with open flats well suited to grazing purposes.

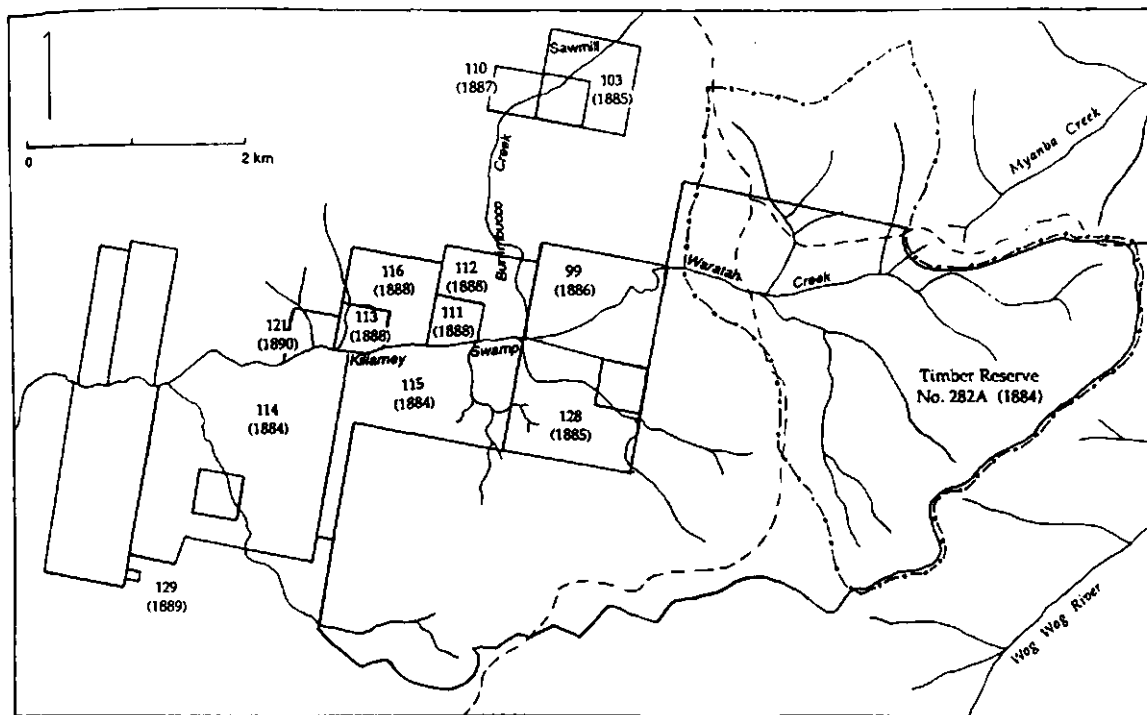
I fixed part of the west boundary of this reserve marking the extremity of my survey by a peg numbered 50 chs, in order to allow of would be selectors taking up the land adjoining, without fear of encroaching on the Reserve, which consideration had before deterred many from doing so. More urgent instructions would not permit me to make a complete survey of these boundaries, which in such densely wooded and scrubby country would have occupied some considerable time (Letter to Surveyor General, 6 April 1884. Lands Department, Miscellaneous Branch Correspondence. Archives of New South Wales 9/4367).

As a result of this process of redefining the boundaries of the reserve, Forest Reserve 282 and its western extension were revoked, and on 1st September 1884, Forest Reserve No. 282a (1620 hectares) was declared under the Crown Lands Alienation Act of 1861. The reserve was renamed Timber Reserve 282A under the Timber Regulations associated with the Crown Lands Act of 1884. Figure 4 details the location of the modified reserve, and the selection of land that took place in its vicinity during the period 1884 until 1893, in relation to the previously alienated lands and modern roads.

In February 1885, John Rootsey applied for a Conditional Lease of Portion 103, adjacent to his Conditional Purchase of Portion 88. The plan made for Portion 103 in November 1886 reveals that, amongst other 'improvements', a sawmill stood in the northern section of the portion (approximate location marked on Figure 4). The sawmill shed was valued at £20. The other improvements included a house, kitchen, outhouses, bark hut and yard, the total value of which was considered to be £68.

In March 1894, Surveyor Halliday of the Land District Office in Cooma reported as instructed on the timber requirements of the Parish of Burrumbucco. In particular, he addressed the issue of whether any more land should be reserved for timber purposes in the vicinity of Coolangubra Trig. Station (present day Kanoonah Trig. Station). To carry out his instructions Surveyor Halliday inspected Timber Reserve 282A and found that:

The eastern part of TR 282A contains excellent timber, but the western part formerly standing as an extension to FR 282 does not contain sufficient good timber to justify its retention as a Forest Reserve. The western boundary of TR 282A should be a line



Key: - - - - - Waratah Creek Catchment Area
 - - - - - Modern Roads (Coolangubra Forest Way N/S,
 Wog Way Road E/W)
 41 (1873) - Portion Number (date of selection)

Figure 4 Land Tenure 1884-1893

running north and south situated 40.00 [chains] east of the east boundary of portion 41. A Saw-mill once worked on the timber of this reserve. Occasionally timber is still split and drawn from the eastern part of it (Letter to District Surveyor, Cooma, 2 March 1894. Lands Department, Miscellaneous Branch Correspondence. Archives of New South Wales 9/4367).

He also reports that two sawmills once operated near Coolangubra Trig. Station, drawing a large quantity of timber from the surrounding area, which was apparent from 'the old disused timber tracks leading almost to the summit of the Trig. Station'. Surveyor Halliday concludes that it is not likely that sawmills will again start up in the vicinity of the Trig. Station, as better timber exists near Cathcart. However, he recommends the reservation of the area surrounding Coolangubra Trig. as a Timber and Trigonometrical Reserve, as he considers the land to be poor and stony and not likely to be required for anything other than timber supply. In addition, he recommends the revocation of the western part of Timber Reserve 282A.

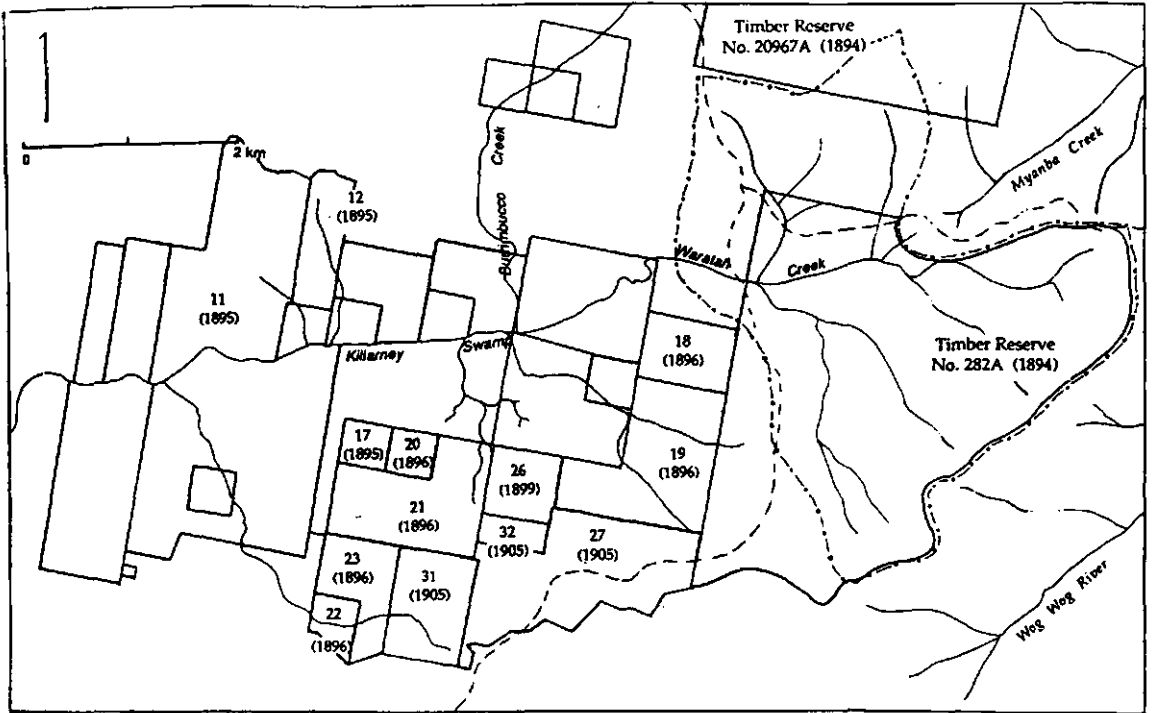
As a result of this proposal, Timber Reserve No. 20967 Class A, incorporating an area of 1170 acres surrounding Coolangubra Trig. Station was gazetted in June 1894. The revocation of part of Timber Reserve No. 282A was gazetted in March 1895, reducing its area to 1900 acres. Figure 5 details the location of Timber Reserve No. 20967A and the new boundaries of Timber Reserve 282A, as well as the further selection of land in the vicinity of the reserves which took place from 1894.

In 1904 another review of the reserves was undertaken. This review was possibly carried out in connection with an assessment of land for resumption under the Closer Settlement Act, introduced in 1904. The District Surveyor reported that Timber Reserve 282A included 'timber of various descriptions, large but not of a lasting quality, country fair grazing if cleared, but costly to clear', therefore permanent retention was recommended. Timber Reserve 20967A was reported as containing 'Timber large and of fair quality, of many varieties, country mountainous and not adapted for settlement', and permanent retention was also recommended. No records of logging during the first decades of the 20th century were found, but records did reveal that the western half of the reserve was subject to a number of Annual Leases for grazing purposes during the period 1903-1917.

State Forest No. 547, 1917-1969

A decision to dedicate Timber Reserve 282A as a State Forest was made in 1915. In October 1917 its status as a Timber Reserve was revoked, and the area was incorporated into an area of 1465 hectares gazetted under the *Forestry Act* of 1916 as Coolangubra State Forest No. 547. Timber Reserve 20967A was also revoked, part of it being included in State Forest No. 547, and another part in Bombala State Forest No. 130. State Forest No. 547 received its first extension of 1725 acres on 3 July 1925, increasing its area to 2163 hectares and including the entire catchment area, and was not further extended until 1971.

During this century, the Waratah Creek area of State Forest No. 547 has been subject to some selective logging. Evidence of this takes the form of stumps with board marks, indicating pre-chainsaw logging, visible close to Coolangubra Forest Way within the catchment area. Additionally, a portable spot mill was located in the Killarney Swamp area in the 1960s, cutting timber from the nearby forests for use as building timber in Melbourne (Merv Peadon, pers. comm.). Grazing in State Forests is permitted under the Occupation Permit system of the Forestry Commission of NSW (Grant 1989). Records of the Forestry Commission of NSW indicate that State Forest No. 547 was subject to a number of Occupation Permits during the period 1918 to 1968, but do not indicate the boundaries of the permit areas.



Key: - - - - - Waratah Creek Catchment Area
 - - - - - Modern Roads (Coolangubra Forest Way N/S,
 Wog Way Road E/W)
 41 (1873) - Portion Number (date of selection)

Figure 5 Land Tenure 1894-1916.

Integrated logging, Conservation Reserves, and National Estate listing, late 1960s - Present

Resource surveys of the south-east region of NSW were carried out in the late 1960s by various land management organisations. In 1969, the Forestry Commission of NSW negotiated a licensing arrangement with Harris Daishowa (Australia) Pty. Ltd., for the sale of pulpwood from the forests of a defined area in the south-east of New South Wales. The resource surveys and the commencement of the pulpwood logging operation in the late 1960s began a process of large areas of previously vacant crown land being dedicated as State Forest or National Park (Carron 1985). Several additions were made to Coolangubra State Forest No. 547 in the early 1970s bringing it to the approximate size and boundaries it has today.

In 1981 a number of compartments within the Waratah Creek catchment area were proposed for integrated logging. At the same time, it was decided that the logging of this area would be conducted in a manner so as to enable the effects of logging upon wildlife populations to be assessed. In 1982 and 1983 pre logging surveys of fauna populations were carried out, and it was determined that logging prescriptions would incorporate three different canopy retention rates (10%, 25%, 50%), in order to assess the effects of different silvicultural prescriptions upon faunal populations. Logging as part of this project took place in 1984 on four coupes. Research on this project is ongoing, but has resulted in a number of publications to date (Kavanagh 1984, 1987, 1988, 1990; Webb 1985; Goldingay 1986, 1987, 1989; Goldingay and Kavanagh 1988). Since 1984 further plans for integrated logging within and surrounding the catchment area have been made, and some logging has taken place in compartments within the catchment area to the north of Wog Way Road.

Late in 1985, an area known as Coolangubra Forest Area, incorporating the Waratah Creek catchment area, was nominated for consideration by the Australian Heritage Commission for listing in the Register of the National Estate (Australian Heritage Commission 1986). Areas nominated for listing in the Register of the National Estate are assessed in terms of their national estate values against several criteria. Coolangubra Forest Area was formally listed upon the Register of the National Estate in 1989.

The National Estate Coolangubra Forest Area is divided into 13 sub-areas. One of these is called 'Waratah Gully sub-area' and incorporates the Waratah Creek catchment area, and adjoining areas to the north and south. Each sub-area, as well as the overall area, is assessed against the criteria for listing upon the Register of the National Estate. The overall assessment under this process for the Waratah Gully sub-area states that it is 'of very high value for its biological diversity, wildlife habitat, scenic and reference values, and its representation of forest associations' (Australian Heritage Commission 1991).

The catchment area was also part of the focus for community protests against logging in forests listed or proposed for listing in the Register of the National Estate in the late 1980s. Some of the protests were aimed at preventing the completion of Phases 2 and 3 of Wog Way Road, Phase 1 of which bisects the catchment area, and this led to a number of blockades and demonstrations at various places along the road within the catchment area.

In 1988 the southern part of the Waratah Creek catchment area was set aside as Waratah Creek Forest Preserve No. 259, in recognition of its special values in terms of diversity and relative abundance of arboreal faunal species (Forestry Commission of NSW, pers. comm.). In March 1989 this area was gazetted as Waratah Creek Flora Reserve No. 139 comprising an area of 880 hectares under

the Forestry Commission of NSW Native Forest Preservation Program (Forestry Commission of NSW 1989a).

In 1989, the Commonwealth and NSW State Governments agreed to set up a Joint Scientific Committee for the purpose of reporting upon the biological conservation of National Estate areas in the south-east forests of NSW (Richards *et al* 1990), as a result of the conflict which had occurred over logging in the area. The committee reported in July 1990, and in October 1990, after considering this report, the NSW State Government and the Commonwealth Government reached an agreement about the declaration of new National Parks within the area. One of the proposed National Parks is called Coolangubra National Park and incorporates that part of the Waratah Creek catchment area within the Waratah Creek Flora Reserve. To date, gazettal of new National Parks under this agreement has not occurred.

Discussion

The results of the historical investigation as outlined above provide an overview of land occupation in the Waratah Creek catchment area, on which to base a discussion of the broad nature and pattern of human uses of the land, throughout the period of human occupation.

Aboriginal use of the forest

It is estimated that Australian east coast eucalypt forests were first occupied by Aboriginal people, although sparsely, some 20 000 years ago, and that populations have increased within the last 5000 years. Types of forest products which may have been utilised by Aboriginal people include animals and plants for food, bark and wood for implements, weapons and shelter, and resins as adhesives (Boutland 1988). As mentioned in the results section, it is difficult to build a clear picture about the nature of Aboriginal occupation of the south-east forests of NSW prior to European occupation, as archaeological work in the forests of this region has only recently begun. However, it is thought that Aboriginal use of the Waratah Creek area would have been high, due to the diversity of flora and fauna it supports (Forestry Commission of NSW 1989b). More detailed research on the total period of human occupation of the region however is obviously needed to provide a complete picture of the nature of Aboriginal land use of the region at various times.

Pastoralism, 1830-1871

Most of the evidence about the period of European pastoralism in the area takes the form of general details about the boundaries of pastoral runs, and numbers of stock, people and improvements within these runs over the whole region, rather

than any details about the pattern of land use within a particular run. Whilst it is possible to determine which properties encompassed the catchment during this time, and the general nature of land use within these properties, it is only possible to speculate about the pattern of this land use within the Waratah Creek area. With these limitations in mind, the possible pattern and nature of land use during the period 1830-1871 is discussed below.

European squatters arrived in the area in the late 1820s. The squatters came to graze or run cattle and sheep on vacant crown land, free from government regulation. The Waratah Creek catchment area formed part of the Maharatta run until that property was divided into three parts in 1848, and the catchment area was included in the newly formed Bald Hills Station run. Until 1848, the closest settlement of the Maharatta run to the Waratah Creek area was an outstation called Burrimbucco, located about five kilometres west of the catchment. This outstation is recorded as being a sheep station, and as the catchment area was heavily timbered, it is unlikely that it would have been included in the area used for sheep grazing.

The Bald Hills Station run however, was recorded as being exclusively a cattle run, capable of running 600 cattle. Although no details on the operation of this property were located, it is possible that the catchment may have been part of the area grazed by the cattle of this run. In particular, the land immediately surrounding Waratah Creek, being flat and well watered, may have been one of the better grazing areas in the property if the understorey was dominated then, as it is today, by grasses. With the aid of ringbarking and burning, the grassy understorey could have been encouraged, providing a favourable environment for the grazing of cattle.

The road marked on surveyors' plans and County maps as passing through the catchment area may also have been associated with the cattle industry in the southern Monaro region. The ranges between the coast and the tablelands were dissected by a number of tracks and roads from the earliest times of European occupation, as transport of stock to the major markets of Sydney and Tasmania was often quicker by sea than by land. It is known that from 1833 cattle were walked to Eden from runs to the north of Bombala to be shipped to Tasmania (Platts 1989). It is possible that the road recorded as passing through the Waratah Creek catchment area may also have been used for this purpose.

Selection and reservation, 1872-1916

Details about land occupation in the catchment area during this period are recorded to quite a detailed scale, including the boundaries of reserves and selected portions, and the recording of structures such as fences, houses, orchards and even a sawmill, on the portion plans. A general interpretation of land use can be made from this evidence, and further evidence is provided in the

details of surveyors letters regarding the uses of the forest reserve. These interpretations are outlined below.

Selections of land under the *Crown Lands Alienation Act* of 1861 did not begin in the vicinity of Waratah Creek until 1872. In 1876, the major part of the catchment area was encompassed within an area declared a reserve for the preservation and growth of timber, called Forest Reserve No. 282. The aim of forest and timber reserves was to reserve crown land, which might otherwise be selected and cleared, for the permanent production of timber.

The change in land tenure of the major part of the catchment from that of pastoral run to forest reserve did not necessarily mean an immediate dramatic change in the land use of the catchment area. It is likely that if cattle were grazing in the catchment area before the declaration of the reserve, they would have continued to do so immediately afterwards. Greater regulation of forest reserves would have come with the creation of the position of forest inspector in 1882 (Hannah 1986), but this regulation was focused upon the clearing and cutting of timber, rather than grazing.

More intensive use of the catchment may have begun with the influx of selectors into the area after 1884. Schofield (1990) states that much of the effort of selectors was directed towards paying off the debt that had been incurred in purchasing, or conditionally purchasing, their selection. She outlines their situation as follows:

The selector could clear his land and fence it and build a slab hut roofed with sheets of stringybark, or even a dropped log house roofed with shingles, using nothing but his own time and labour and a few tools. He could hunt for food and clothe himself in the skins of the animals he shot, but he needed money to make his repayments, to buy stock, and to buy the seed to sow grain crops (Schofield 1990: p. 61).

Schofield indicates that this money could be earned through the growing of crops, hunting of native animals for their pelts, or by stripping wattle bark for tanning. Schofield's outline provides a good summary of the types of land use activities employed by selectors in forested areas. It is possible that the selectors of the Killarney Swamp area may have utilised the Waratah Creek catchment and other surrounding areas of forest for a number of the purposes mentioned above, including hunting animals for skins, stripping of wattle bark, and the collection of bark and timber for housing.

An additional use of the catchment area that is evident from surveyors' letters assessing the boundaries and condition of the reserve, was the cutting of logs to be turned into sawn timber. The letters reveal that a sawmill had worked on the

timber of the reserve at some time before 1894. Additionally, the eastern part of the reserve still contained excellent timber in 1894, and timber was at that time being occasionally split and drawn from it. Sawmills at this time were often established within the forest, rather than in townships, as it was more economical to cut timber and mill it on location than to transport logs any great distance. As such, many mills were temporary, remaining on a site until the timber was cut out, then moving on to new sites. Bush mills were often established in response to demand for sawn timber for housing resulting from the establishment of a new town or village (Hannah 1986). The mill referred to in the surveyors' letters was possibly that identified in the surveyed portion plan for Portion 103, taken up by John Rootsey as a Conditional Lease in 1886. The demand for timber which resulted in the establishment of this mill was probably associated with the increase in selectors in the general area after 1884. It is possible that the mill cut timber both from its immediate surrounds, and from the nearby Forest Reserve. The differences in these sources of timber are described below.

The surveyed plan for Portion 103 indicates that it was 'very heavily timbered with gum, peppermint and messmate'. A publication of the Forest Conservancy Branch of the Department of Mines in 1884 entitled *The Timber Trees of New South Wales* (Nilson 1884), details the habits and value of the timber of various tree species in New South Wales at this time. The value of *E. radiata*, the peppermint species present in the area, is not recorded. The gum present in this area is *E. viminalis* (mann gum) which is referred to as being 'not much valued'. However, the timber of *E. obliqua* (messmate) was regarded as 'excellent for house-carpentry, flooring boards, battens, and other scantlings, and for fencing. The bark may be used for thatching, and for making paper.' (Nilson 1884: p. 67). This species may have been the focus of cutting within the immediate surrounds of the mill.

Reserve No. 282A was located less than two kilometres to the east of Portion 103. Cutting timber from this reserve would have involved the cost of transportation of logs to the mill, and the payment of a timber cutters licence fee. This fee was double that for cutting timber on non-reserve Crown Lands (Grant 1989), however, the quality or quantity of the timber available within the reserve may have offset these costs.

Information about the vegetation of the reserve is recorded on the survey plan for Portion 88, as it was surveyed with reference to the location of Timber Reserve No. 282A. The north western corner of Timber Reserve 282A was noted as containing the 'mountain ash' species. Although at present the common name, mountain ash, is reserved for the species *E. regnans*, in 1884 the name applied to a variety of species in Victoria and New South Wales thought to be related. The species referred to in relation to Timber Reserve 282A as mountain ash is *E. fastigata* (brown barrel), a species once thought to be a form of *E. regnans*

(Maiden 1929). Nilson (1884) describes the timber of mountain ash as 'tough and durable, used for shafts of drays and carts, rough carpentry, and fencing; it was said to make better staves for casks than the timber of the spotted gum.' (Nilson 1884: p. 75).

The sawmill was not recorded as still operating in 1894, so presumably the demand for large amounts of timber from this locality had been satisfied by that time. During the first two decades of this century, grazing was still occurring in the reserve, as Annual Lease papers indicate that grazing took place on land surrounding Waratah Creek on an annual basis over a number of years.

State Forest No. 547

Evidence of selective logging thought to have occurred in the early part of this century remains in a number of places within the catchment area, but no records were located to provide any details of amounts cut, or dates of cutting. Further grazing under the Occupation Permit system that is recorded for State Forest No. 547 may have been located within the catchment, but its extent or intensity is not recorded.

Some cutting of timber occurred in the 1960s, but more intensive logging and roading through the area has only occurred in the past ten years, with experimental logging and integrated logging associated with the establishment of a woodchip mill at Eden. Additionally, during the past decade, the area has been the subject of much scrutiny by the scientific community, and has been recognised as being of special importance, particularly for its high biological diversity. As a result of this recognition, part of the catchment area was included within the Waratah Creek Flora Reserve, the management of which precludes further logging. This part of the catchment has subsequently been recommended for inclusion within the proposed Coolangubra National Park.

Conclusion

This study has been able to outline patterns of land occupation of the study area, and broad categories of land use for the past 150-200 years. This indicates that the catchment area has been subject to many different forms of land use over the period of its occupation. Aboriginal people are likely to have utilised its resources for food, shelter and clothing, for at least the last 5000 years. European squatters may have grazed their cattle in the area for a period of 30-40 years from 1845. This was followed by a period of at least 10 years from around 1884 characterised by more intensive use, including cutting of trees for timber, stripping of wattle bark for use in tanning, and *Eucalyptus* bark for use in housing, as well as hunting and trapping of forest animals for food and skins. The following 85 years marks a long period of intermittent selective logging and

grazing, when it is difficult to estimate the intensity of this use. The past ten years have been characterised by intensive integrated logging, research, reservation of part of the area from further logging, and forest conflict.

Further work would be necessary to build up a model of the role of the various human disturbance, land use and management regimes in the ecological dynamics and processes of the forest. This would include finding evidence which describes ecological states at various periods in the history of the forest, defining the specific management or land use practices associated with the broad categories of land use identified, and investigating evidence contained within the forest relating to ecological changes which may have occurred.

In general, the results of this study of a small area in south-eastern NSW suggest that, as in the recent study of East Gippsland (Brady, Chapter 3), it may be possible to build up a detailed regional picture of human occupation and interaction with the forest environment over time for south-eastern NSW. This type of picture, whilst contributing information necessary to assess the effect of human land use and management regimes on ecological processes, is also intrinsically useful through creating an awareness of the extent and variety of uses of the forest by people, in areas which have often been described as pristine.

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CHAPTER 9

VICTORIAN SCHOOL OF FORESTRY: FORESTRY EDUCATION

Frank R. Moulds

The town of Creswick, has the sign 'Home of Forestry' at its entrance. This is not strictly true - Macedon, some 150 kilometres to the east has more claim to that title because when trainees in forestry were appointed in the 1880s and 1890s they all spent from one to three years at Macedon with its relatively new forest nursery (opened in 1872) before being despatched to other state forests. However, Macedon did not have a Premier living there, nor a Minister for Education, nor a big goldfields hospital no longer required which Creswick did. So it missed out when the government purchased these buildings in 1908 and set up the School of Forestry with its first intake of students in 1910.

The first references in Victoria to the need for training of forest officers go back to Royal Commissions and Boards of Enquiries on Victorian forests in the period 1870 to the early 1890s especially those reported by eminent foresters from the Indian Forest Service, Vincent in 1887 whose report was never published and Ribbentrop in 1896 whose report was published by the Government and was followed by a Royal Commission. All referred to this need and several commented that it was not feasible to bring out trained foresters from Europe because the Australian forests were so different to those in which they had learnt their forestry. Among the first proposals was the establishment of a forestry training centre at one of the then existing Victorian agricultural colleges - Dookie and Longeronong - but perhaps surprisingly, this did not receive sufficient support.

Creswick was very suitable as a training centre because it formed part of the Dividing Range - Central Highlands - Wombat Forest - Goldfields system which had become heavily used as a timber supply source for the gold mining, home building and railways industries from the 1850s onwards. Gold had been first discovered in 1851 in nearby Clunes. Forest values were becoming recognised in the early 1890s (especially for their timbers, but also for protection of water supplies, provision of soil stability and also, it was thought, added rainfall). These were the reasons for the establishment of the two major state nurseries at

Macedon and Creswick, basically to provide trees for reforestation of areas denuded by over-cutting mainly for the goldfields, and later to provide trees for farm planting.

The numerous mines around Creswick, Bendigo, Ballarat and many other towns used enormous amounts of timber. It was estimated that Ballarat, for instance, in one year, 1860, consumed 180,000 tonnes of fuel wood, 850,000 mining props, 3 million laths and over 3,000 cubic metres of sawn timber. In 1902 one mine alone in Creswick employed 180 miners and 70 wood-cutters to feed the boilers which operated the pumps. Victoria's goldmines had 1,150 steam engines in 1873 and it was claimed they consumed 1 million tonnes of fuel wood in that one year. Wooden tramways were not used in this area for timber transport because horse-drawn transport could penetrate the forests fairly easily. The golden era of Creswick is a story in itself with the rich alluvial mines supporting thousands of miners for some thirty years, followed by auriferous quartz reefs, and then the enormously rich deep lead mines (34 in only 16 kilometres) with shafts gouged through the basalt lava flows and then tunnelling along the submerged creeks picking up rich gold on the way.

During this heavy utilisation period much was learnt about the behaviour of the forests as well as individual tree species, most of it accidentally - such as the ability of most species to coppice readily, the manner of seedling regeneration, responses to fire, responses to thinning etc. In fact the birth of silviculture of our native species occurred in these goldfields, such as in the mixed eucalypt forests of messmate and other stringybarks, peppermints and gums of the Dividing Range; the ironbark, yellow gum and box forests north of the Divide in Bendigo and other northern regions; and even a little about the ash-type forests in the moister southern regions and the red gums of the flood-prone areas in the north of the State. By the end of the century a good deal of basic knowledge had been accumulated and a beginning had been made on the dedication of State Forests and Timber Reserves to meet the needs of an expanding population.

It is interesting to note in the Creswick area, as in many other localities, how private property boundaries follow geological ones. Virtually all the basaltic plains with their relatively recent fertile soils are privately owned, while the forested public land with its poor soils derived from sandstones and shales of Ordovician origin became State forests. The foresters were left with the poorest areas on which to grow trees, a not uncommon situation.

The early Conservators of Forests, as they were titled prior to 1907, were under the control of the Lands Department which was more concerned with opening up Crown Land for settlement than it was with the management or protection of forests. One report actually said 'to create this important appointment ... and then to employ him, in fact, as a subordinate clerk of the Lands Department ...',

seems an almost incredible folly. Yet this is what happened' (Royal Commission 1901).

The Forests Commission was established in 1919 which for the first time provided a specific management structure for State Forests of which some 4,000,000 acres (1,600,000 hectares) had been dedicated as such by that time. The Commission regarded its first task to obtain many more dedications of high quality forests before they fell to the selector's axe. It was claimed that a minimum of 6,000,000 acres (2,400,000 hectares) was needed in Victoria.

One example suffices from the Royal Commission - the loss of much of the great Otway forests, 'In the year 1879 the temporary reservation of the eastern area of 193,000 acres (78,100 hectares) was cancelled to make lands available for selection ... in 1886 the Beech Forest was thrown open for selection'. Other areas followed until most of the Otway forests were lost to selectors. The report suggested 'it is doubtful whether in any other part of the colony, there is to be found such a variety of valuable timber trees as in the Otway Peninsula.' The loss of the Strzelecki forests in South Gippsland was similar. Both of these areas are now being reforested by both public and private bodies at great expense - prime examples of bad land-use decisions by government.

It was in that context that the School of Forestry was established here in Creswick in 1910 - trying to beat the gun on selectors and to show how forests could be managed with profit for the State. The conflict was a bitter one between the proponents of more land for agriculture and those with vision who saw future values in forests.

The early days of the School of Forestry saw only a handful of students passing through the School, viz 22 from 1910 to 1918, but including R.G. Lindsay of the famous Lindsay family of artists, Albert Jacka, a VC winner, a future Chairman of the Forests Commission (F.G. Gerraty) and a future deputy chief of the Forests Products Division of the CSIRO (C. Sibley Elliot). Class work was a minor part of the course in the first year or two, the major part being practical work in the field and at the State nursery nearby.

Teaching staff was a particular problem. For the first few years, basic sciences such as soil studies, chemistry, geology and surveying, were taught by staff of the Ballarat School of Mines. The first Chairman of the Board of Examiners was Professor A.J. Ewart, Head of the Botany School of Melbourne University, and from that time onwards a strong connection has been retained with the University of Melbourne. The first resident Principal was C.E. Carter from the Education Department, who was sent to Yale University in 1920 for further training in forestry.

In the period 1910 to 1920, forestry education became a perennial subject for discussion at interstate forestry conferences of permanent heads and sometimes Ministers, with everyone agreeing something should be done but with little agreement as to what and where, so that little was achieved. Ultimately, and unfortunately, the subject became political and controversial with State and Federal issues involved, as well as interstate rivalries. After Carter's return from overseas, an appropriate curriculum was developed with formal class-work covering the principles of sound forest management, protection and silviculture. Graduates were equipped for the first time, for the task of bringing the State's forests under sound scientific management with sustained yield as the goal.

The intakes of students was about 4 to 8 each year for about 25 years until the mid 1940s. They undertook the 3-year Associate Diploma of Forestry course that provided good practical background in the School plantations, native forests and the State nursery. The best students each year, and eventually all of the graduates, were sent to the University of Melbourne to complete a Science degree and later the Bachelor of Science (Forestry) degree, established in 1943. This has now become the Degree of Bachelor of Forestry Science, with provisions for Masters and Doctorate degrees. Even in those early days the school was regarded as the source of forestry expertise and personnel for private forestry as well as for the Government forests.

In the 1930s considerable tension developed between the Victorian and Commonwealth Governments about forestry education. A University-based forestry school had been established in Adelaide in 1926 which was later moved to Canberra and became the Australian Forestry School. Pressure was exerted on Victoria to send students first to Adelaide and then to Canberra which Victoria did for several years. Top Creswick students were sent each year to these two centres, but when further pressure was applied to close Creswick altogether, the then Chairman of the Forests Commission, A.V. Galbraith, resisted and an unfortunate feud developed between Lane-Poole of the Commonwealth and Galbraith. This lasted for the best part of a decade with no more Creswick students being sent to Canberra, but instead there was a determination to further strengthen the Creswick course. This dispute spilled over into the professional body - The Institute of Foresters of Australia - with difficulties and arguments about membership qualifications. This sad episode weakened whatever prospects the Institute had at that time for strongly influencing forestry matters in Australia.

The strengthening of the Creswick course involved the hiring of more teaching staff, improving library and laboratory facilities and the forging of stronger relationships between the School and the University of Melbourne. For example the University granted recognition of the Creswick courses in Botany, Chemistry, Natural Philosophy and Geology as being equivalent to the first year

of the Bachelor of Science course. Among specialist lecturers engaged were those in Fire Protection, Forest Engineering, Agricultural Chemistry, Chemistry, Forest Pathology and Forest Entomology. A regular stream of selected Creswick students was sent to the University of Melbourne to complete undergraduate degrees. Many were also sent overseas for post-graduate studies.

There is now a new wave of forestry education in Victoria which includes Creswick as the centre of training for the second and third years of the 4-year Bachelor of Forestry Science degrees awarded by the University of Melbourne, with the whole course under the excellent administration of Professor Ian Ferguson. The facilities and forests in the Creswick complex are jointly administered by the University and the Victorian Government. The achievement of this situation took years of negotiation and financial planning. The current situation of two main streams of forestry education in Australia, one based in the Australian National University, and one in Melbourne and Creswick, is possibly the best outcome that could have been expected. It provides two centres of excellence in forestry education with a healthy element of competition for students from both Australia and overseas.

There is also in this complex the Victorian Timber Industry Training Centre with modern wood-working and sawmill machinery to train operators for the logging, milling and seasoning industries. Forestry training in Victoria added a further new dimension in 1992, by the appointment by the University of Melbourne of a Professorial Fellow in Forest Industries, under the Julia M. Hale Bequest.

Forestry education itself has broadened in scope in the last decade or so as the community has become more interested in environmental matters. It has introduced more studies in ecology, wildlife management, community opportunities in various kinds of tree planting, agroforestry and other variations of land use. In a response to community requirements, foresters are now involved in Land Care and Greening Australia, and the school is now called the School of Forestry and Land Management.

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CHAPTER 10

VICTORIAN SCHOOL OF FORESTRY: DEMONSTRATION FOREST

Jane Lennon

The mixed species Demonstration Forest at Creswick provides a cultural landscape of many layers, the creation of many workers over decades.

The basic landscape was formed from Lower Ordovician slates, sandstones and mudstones laid down some 500 million years ago. The ranges of the Central Victorian Divide were gently dissected by local creeks, and the generally thin and poor soil supported tall mature forests of messmate, (*Eucalyptus obliqua*), narrow-leaf peppermint, (*E. radiata*), manna gum, (*E. viminalis*), scent-bark and candlebark (*E. rubida*) with blackwood (*Acacia melanoxylon*) and silver wattle (*A. dealbata*) in the gullies. To the north of Creswick basalt plains are the distinctive landscape component and their source, the volcanoes are obvious features with steep, rounded hills sparsely covered in stunted messmate and sheoak or, where located on private property, bare grassy cones.

The Creswick Brothers selected a squatting run in the locality in 1842 and within the decade gold was discovered and 20,000 people were said to reside in the locality in 1854, the year the town was surveyed (Youl 1992). Recorded forest history of the immediate vicinity of the Demonstration Forest began in 1872 when the 13,822 acre (5,594 hectares) Ballarat and Creswick State Forest was established following two decades of exploitation for mining timbers. Without the forests, mining would have been very difficult as all fuel and timber for the mines came from the local bush. It is difficult to estimate how many thousand tonnes were used. Anderson's sawmill at Barkstead in the Bullarook Forest was an early producer and by the late 1860s two hundred loads (300 tonnes) of timber were hauled into Ballarat every day from the Forest (Bate 1978:118). Woodcutting and cartage were common trades and in 1902 the Berry Consuls Extended Company just north of Creswick employed 180 miners and 70 woodcutters.

The forests also were a source of water, and this was transported north to the mines along earthen races that ran on a very slight angle from the contour.

Reputedly much of the construction was done by Chinese labourers. One of the most important races was tens of kilometres in length. There are several small dams in the Forest from the mining era: Braggs Dam (now Cosgrove Reservoir), Eatons Dam (which burst after exceptionally heavy rain in 1933), O'Keefes Dam, Blue Lake (a spectacular sluic pond) and the largest, St. George's Lake (formerly Government Dam, and presumably dating from the 1880s).

The forest was inhabited by a great number of miners, farmers and wood cutters, who constructed huts and gardens in the forest and whose activities in the forests were impossible to control. They numbered 105 in 1884 and notable forest dwellers were the parents of William G. Spence, the founder of the Australian Workers Union who lived in a hut at Jackass Gully from 1857.

The heavy utilisation over so long a period, coupled with the simultaneous fossicking, means that the forests around Creswick have probably been more intensively occupied than any other bushland in Victoria. There is an incredible density of names: Slaty Creek, Back Creek, Cabbage Tree, Lincoln Gully, Camp Hill, Drakes, Masons, Nuggety, Mopoke, Petticoat, Cobblers, Chinese Gardens, Sawpit Gully, Brackenbury Hill, and so on. (Youl 1992)

The region's first forester, John La Gerche, reported to E.M. Curr, the Conservator of Forests, in 1883 that the forest had been cut over between 1855 and 1875 and that, except for a few scattered individuals, no large trees remained (Zedaker 1991:4). No evidence of regulated forest cutting was found in early records until 1882, when it was declared that no trees under 18 inches (46 centimetres) in diameter should be cut (Historical Places Branch 1986 a). This decision was later reversed because of local pressure for firewood, fence posts and mine props. In 1887, an independent investigator from the Madras Forestry Service warned the Government that the forest was being over cut and the arrangements for licensing cutters and preventing theft were not protecting the resource. The Government reacted by not issuing licences after August 1887 and in 1893 royalties replaced licences and most of the timber cutters abandoned their trade. Prop cutting was also tightly controlled and so the rudiments of forest regulation were established. The first tangible evidence of forest management in the area occurred with fencing and planting areas in Sawpit Gully with exotics in 1888-89. The Creswick State Forest Nursery was also established at this time, although the development of the current site was not started until 1908 and the rustic rotunda was constructed in 1914.

Increasing concern for the forest resources of Victoria resulted in the 1907 Forests Act. An examination system for foresters was prescribed in the Act which led to the purchase of Tremearne House in 1909 and the opening of the School of Forestry in October 1910 (Historical Places Branch 1986 b). In 1912 the former Creswick Hospital was also acquired, altered for school purposes and

opened in May 1913. This former goldfields hospital is listed on the Historic Buildings Register (Lennon 1992:46).

Instruction in practical forestry began in 1923 following the return of the school principal, Mr C. E. Carter, from forestry studies at Yale University and the Demonstration Forest was established with the aim of converting 25 acres (10 hectares) per year to conifer plantations and retaining 600 acres (240 hectares) of the 'better type forest' as a permanent hardwood reserve 'which will be systematically worked over in accordance with correct silvicultural principles'. Wood from the 25 acres (10 hectares) of clearfelling was to be sold to defray costs of operations which would be carried out by students and staff (Zedaker 1991: 5). The School Forest Record Book dates from 1923 and provides details of operations: surveying, scrubbing (ie. clearing), fencing, cutting telegraph poles, transplanting, pitting, cutting bridge timbers and building bridges, blazing fire-breaks, hand weeding (coppicing) pine plantations and thinning and pruning. Rainfall and temperatures were also recorded.

In 1932 the first hardwood improvement cutting was undertaken whereby understorey was removed to favour messmate growth, and the first pine pruning also occurred in this year as did the detailed assessment of the *Eucalyptus* distillery which yielded 74 pounds (33 kilograms) of oil from 3,732 pounds (1690 kilograms) of leaves. In 1933 a management plan was documented for the School Forest which clearly stated that management was the responsibility of the School executive. In 1938 a Working Plan was prepared in which responsibility for supervision, protection and revenue collection was taken by the district forester. The Forest escaped the Black Friday 1939 bushfires. In 1941 the University of Melbourne became directly involved with the School, the first park reserve (the 42 acre (17 hectare) Koala Park reserve) was established in the Forest, and work on a charcoal kiln began. By 1949 the 1924-31 pine plantings had matured and the hardwood forest had recovered enough to make the School Forest a very valuable forest property, yielding mill timber for the first time.

In 1951, L.A. Newman wrote the long promised working plan for the Forest, which was divided into 22 compartments, with a 'High Forest Working Circle' on the most productive lands (ie the gullies) and a 'Coppice with Standards Working Circle' on the dry slopes and ridges. The hardwood forest was estimated to contain 7.7 million super feet (23,000 cubic metres) of mill logs and over 43,000 tons (43,600 tonnes) of firewood on 1,341 acres (543 hectares). Pine planting was reinstated in 1956 following the proposal submitted to the Forests Commission by F.R. Moulds in 1944. The plan was to plant 2.5 to 3 acres (1 to 1.2 hectares) each year for 35 years so that a 'normal forest' could be created for research and demonstration. The plantings, on the southern edge of the Forest were conducted for 15 years until 1970. In the 1960s research establishment reports were filed on pine progeny and clone trials, hardwood seed fall

and coppice thinning trials (Zedaker 1991:10). A Research Station was established in 1969 to solve problems in regeneration and establishment of *Pinus radiata*.

In 1974 the first pine plantations established by the students in Compartment 1 of the Forest were finally clear cut and the next year, by edict of the chairman of the Forests Commission, conversion of hardwood forest to pine plantations was halted. A disastrous fire in 1977 burnt 41 hectares and 10,000 cubic metres of pine in compartments 1-5 of the Forests and in 1979, three compartments were subject to new Land Conservation Council prescriptions protecting water supply catchments, while in 1982, a further three were included in the Ballarat-Creswick Regional Park. As a result of rehabilitation work and other regional concerns, compartment boundaries were redrawn in 1983. There was also conflict over fuel reduction burning in the Forest by the Region.

In 1980 the School merged with the University of Melbourne degree program and with the departure of the last Departmental employees as degree students in 1982, the use of students for the day-to-day operations and management of the Demonstration Forest ceased. In 1987 the Timber Industry Training Centre was established at the School and it utilizes the forest as a location for its field training exercises and as a source of both hardwood and softwood logs. Harvesting in the native hardwoods was resumed after 14 years and the use of the Forest as a teaching tool was greatly increased in 1988, whereby the students lay out and measure a timber sale coupe, harvest it, and mill the logs at the Timber Industry Training Centre to learn practical forestry operation skills.

In 1990 the students developed a management plan for the Forest which lists 479 hectares of mixed hardwood forest of which 334 hectares are available for logging under the State Timber Industry Strategy and the Codes of Forest Practice. Over 19,000 cubic metres of standing sawlog volume is presently available even though approximately 11,000 cubic metres were removed from 1948-1973 (ie in 25 years). The sustained yield of the hardwood forest is likely to exceed 250 cubic metres per year, assuming an 80 year rotation.

Plantations funded by the National Afforestation Program were also established in 1990: a series of replicated plots will illustrate the response of different eucalypt species to fertilization, weed and insect control, and planting density (Zedaker 1991:16).

The Victorian School of Forestry and Land Management is the oldest forestry education facility in Australia and if they are to be true to their goals, the School, the University and the Timber Training Centre must work together to make the Demonstration Forest the State's best example of efficient and responsible forest management. The tighter control of management operations and better documentation of the location and timing of treatments would also

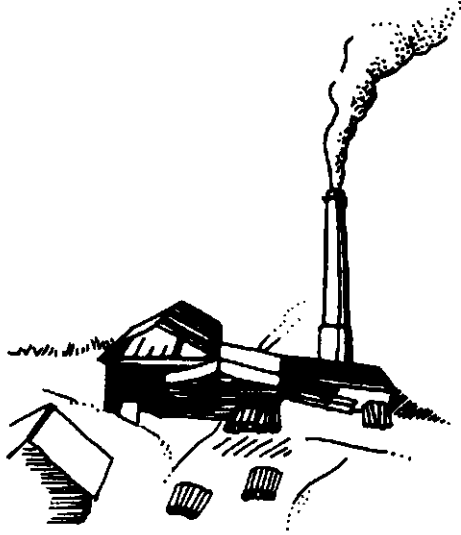
improve the potential for maintaining the integrity of research plots within the Forest. Softwood plantations need to be retained as a teaching source and the original goal of the Forest to be self-sufficient in its operations needs to be revived.

The Demonstration Forest provides a rich mosaic of past activities and treatments for those inclined to decipher the layers of its structure and because of its purpose as a Demonstration Forest it has distinctive cultural values.

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Forest Industries



CHAPTER 11

LOGGING TECHNOLOGY AND FOREST CUTTING PRACTICES

Kevin J. Frawley

This paper is concerned with that stage of the timber industry involving the cutting of trees in the forest and delivery to mill or processing plant. Commonly this has involved three distinct parts: felling of logs; snigging to landing (loading ramp or log dump); loading and hauling to mill. However, in the early period of sawmilling in the 19th century, two stages only were common, with hauling direct to mills which were themselves moved as supplies within an economic hauling radius were depleted. This study is structured around the three main timber production eras identified in the period 1788-1990 by Dargavel (1988) which are associated with particular energy sources which have influenced both logging and sawmilling/processing technologies. They are:

1. Manual production and the first sawmills 1788-1850 (red cedar, native softwoods, eucalypts).
2. Steam power and larger sawmills 1850-1945 (eucalypts, rainforest timber, native softwoods).
3. Electrification and diesel power 1946-1990. Development of wood-chipping plants, pulp and paper (plantation softwoods, eucalypts, cypress pine, rainforest timbers).

Technological change in logging closely parallels technological change in sawmilling, though detailed aspects are different (eg in the period since the Second World War, electricity has been the main sawmill power source, while the internal combustion engine has been the main logging power source). Technology is considered to be a combination of tools and equipment designed for both specific and general tasks, as well as the techniques and skills needed to design, operate and improve upon those tools and equipment. A key factor in technology is energy, and changes in the operational nature of the Australian timber industry generally, are closely associated with changes in principal energy sources. Tools and equipment used in logging may be adaptations to that purpose of items not specifically developed for logging use, but representing a

broader level of technological change eg steam powered engines, crawler tractors. Alternatively, they may be items specifically designed for the industry, to handle particular tasks or overcome production problems eg chainsaws, feller-buncher harvesters. Logging technologies have a clear relationship to the physical nature of the country on which the forests grow as well as the type of forest. Some Australian forests have been particularly easy to work (eg Western Australian jarrah forests), others have presented considerable difficulties which have limited exploitation (eg north Queensland rainforests).

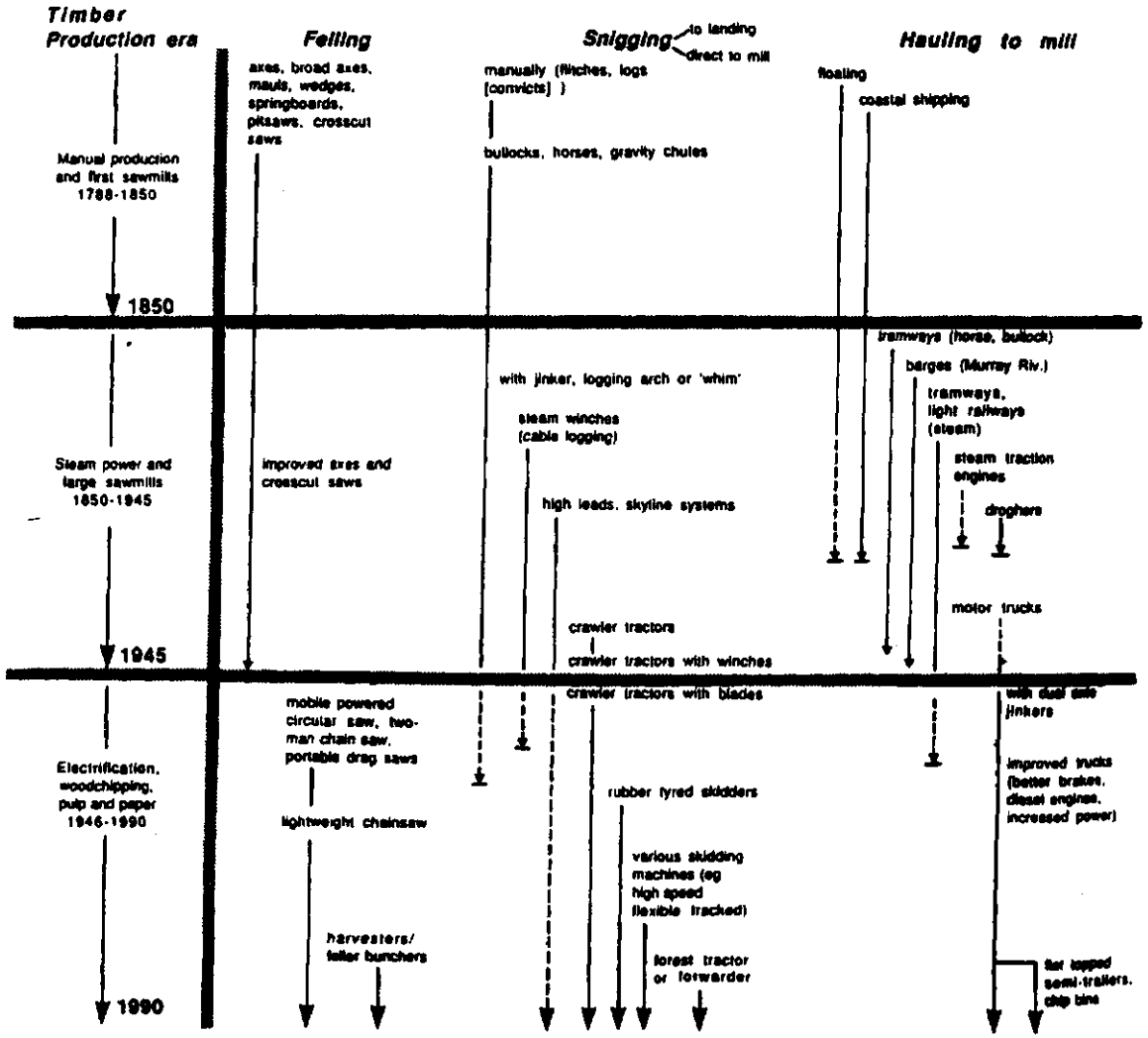


Figure 1 Eras in the history of the Australian timber industry.

Manual production and the first sawmills 1788-1850

Manual production (including manual transport) dominated the timber industry for the first half century after settlement. Dargavel (1988: 19) suggests there were probably less than 20 sawmills built before 1850 and they sawed only a small proportion of the total production. Sawmilling rapidly overtook manual production from the 1850s, but manual production had a long gradual decline rather than a sudden halt.

Steam power and large sawmills 1850 -1945

Sawmilling 1850-1900

During the 1850s and 1860s sawmilling became established in all the major timber production areas. Better steels for saws and the availability of mass produced steam engines were highly significant for sawmilling. These sawmill developments little affected felling which was still manually performed, but steam power began to make an impact in log hauling and transport.



Figure 2 Sawmill, Redhead, New South Wales. In *The Graphic Australian*, Sydney Nov 23 1889

Sawmilling 1901-1945

The timber industry was well established in 1900. Structurally, the industry comprised a large number of small, mostly family-owned sawmills scattered through the forests, some large mills especially in Western Australia, and timber merchants and town mills in all major cities. In this period steam power found wide application in sawmilling, log hauling and also in log snagging. Crawler tractors, motor transport and electricity became available in the 1930s. In some regions internal combustion engines (petrol, kerosene, diesel) were adapted to sawmilling and log hauling by small mills. The period 1900-1945 saw the firm establishment of professional forest management in Australia with legislation and the establishment of state forest services, however, these had little effect on milling operations prior to the 1950s.

Electrification, woodchipping, pulp and paper 1946-1990

The post-war period of economic reconstruction was a boom time for the timber industry and the number of mills expanded considerably. Many of these were small diesel powered forest operations producing rough-sawn scantling. However, more long term changes were soon evident. The larger mills grew and consolidated, some buying out their small competitors. Sawmills relocated to towns and cities where they could be on the public electricity grid. Pulp mills were built or expanded in Tasmania, Victoria and South Australia and the quantity of pulpwood used quadrupled (Dargavel 1987:6). The forest operations supporting the pulpwood mills and woodchip export industry were able to make full use of the new logging technologies which had become available after the war. Clearfelling replaced selection cutting in areas serving pulpwood markets and silvicultural procedures aimed at regenerating uniform stands.

After the war the shortage of timber and previous overcutting of more accessible forests led to movement into the more remote and rugged mountain forests. This was made possible by the use of bulldozers for roadmaking and motor trucks for log transport. From the 1970s, there was major restructuring in sawmilling as hardwood mills closed, amalgamated, or were bought up by larger mills for their quotas. Increasingly, ownership was concentrated and production centralized.

By the 1980s the major trend in the sawmilling industry was the increased use of plantation pine in a wide variety of applications, and the construction of sawmills, or more commonly, large integrated plants, to process the logs. From the logging viewpoint, much of the hardwood resource from regrowth native forests and hardwood plantations will become increasingly similar to the softwood plantations. These forests will be characterized by smaller trees, even-aged stands, more intensive management, and prescribed environmental guidelines in their working. In this way they will become much more suitable for the application of logging technologies which have been developed for plantation

forests and small tree harvesting especially (but not exclusively) in the northern hemisphere.

Logging Technologies and Cutting Practices

In this section specific logging technologies employed in native forests are documented and described, and the geographic spread of their usage outlined.

Felling of logs

Compared with snigging to the ramp and hauling to the mill, tree felling was little affected by technological changes until after World War Two.

In the first European settlements the felling of trees was followed by sawing into desired lengths and the pit-sawing of these log sections into flitches of a manageable size. While pit-sawing was later replaced by sawmilling, and whole logs could more easily be moved with animal power, some pit-sawing survived at least until the 1890s and possibly later. The limitations of this first logging technology especially in dealing with the hard, heavy, non-buoyant eucalypts was the primary reason why the discovery of lighter woods such as red cedar was so important.

Few convicts or free settlers had skills in working timber, and naturally, no experience of the Australian hardwoods which presented great problems in utilization. However, through ingenuity and trial and error, methods were devised for dealing with the forests and timbers of the different parts of Australia - much of this in the process of agricultural clearing. As early as 1827, for example, ship's surgeon P. Cunningham was able to describe the method of cutting a 'drive' to clear rainforest in the Illawarra:

The more usual method, however, is to chop a row of trees fully half through, then fell a heavy one at the end of the row, so that it may fall against the second, which snapping at the chopped part of the stem, falls in like manner against the third, and so on till the whole row of trees is beaten to the ground. (Cunningham 1827 (v.2): 164)

The essential tools of tree felling from first settlement until after World War Two were axes and crosscut saws. Though early axemen looked for better axes with sharper blades and harder steel, these were slow in coming. The axe which did eventually meet Australian demands was the Australian designed 'Kelly' brand made in the USA and sold here from about the turn of the century. 'Kelly' became the slang word for axe - a term still used by some in North Queensland in the 1970s. 'Plum' brand axes from the USA were also popular (Vader 1987: 93-5). Cross-cut saws had an 'M-tooth' blade and handles at

either end for operation by two men. In the latter part of the century, the saw was improved by extra teeth that raked out the sawdust leaving a freer cutting face.

Eucalypts and rainforest trees were usually cut above the butt - heights of 2-3 metres were common, but sometimes much higher. The reason for this was to avoid defect timber in the butt and to supply a more cylindrical log to the sawmills, or for hewing or splitting locally. To work at these heights, cutters erected a platform around the tree, or made a ladder with a top platform, or cut a notch and inserted flat metal-shoed spring boards, or simply used strong samplings cut nearby. Selection of trees for cutting through the period to 1945 was largely at cutter discretion. Axemen would sound out a tree for a clear 'ring' to determine the likelihood of defects such as termite infestation. Very large trees were avoided in earlier times when there was limited ability to mill large girth logs, although sometimes they were blown apart with explosives.

The tree falling techniques outlined above were common across Australia and in all forest types. The native softwoods (pines) of Tasmania and Queensland and the cypress pine of the eastern inland were cut closer to the ground having no butt swell. Sawpits belong especially to the early manual period of timber-getting. Some were established in the punishment stations in New South Wales, Tasmania, and Queensland as part of a regime of 'punishing' work for convict offenders (Dargavel 1988:5). While the first sawpits were solidly built at central sites, it later became more practical to construct temporary ones near the trees to be cut using an above-ground platform often conveniently utilizing a gully or creek bed. Pit saws were a modified form of cross-cut saw tapered at the bottom, and with an extended 'T' handle at the top to allow use of its full length. They cut on the downstroke only.

Hewing and splitting were also carried out in the bush. Basic tools were axes, broad axes, mauls and wedges. Splitting developed into a craft skill in the production of accurate split shingles, palings and slabs. Hewing of large dimension timbers also became a finely developed skill. Both activities were highly wasteful of timber as only straight 'free splitting' timbers were used.

Railway departments also demanded highly precise dimensions, considering the task to which the product was to be put, as well as prescribing certain species. Monthly sleeper 'pass' days were a test of wits between sleeper cutters and railway inspectors. Manually hewn sleepers were specified well into this century as this ensured that only good quality, straight grained timber would be used, whereas a sawmill could produce sleeper dimension material from almost any wood. Important areas of sleeper production have been Western Australia (jarrah, karri), Murray River (red gum), inland New South Wales and Queensland (ironbark, white mahogany, tallow-wood), and Tasmania (Tasmanian blue gum).

The importance of the development and rapid adoption of mechanized falling in the late 1940s can hardly be over-emphasized. Timber demand, larger sawmills and rising costs meant that increased output and more efficient forest operations were necessary. Even in the mid 1950s, however, manual falling continued in more rugged areas.

Three types of powered saw made their appearance in the 1940s (McGrath 1956). One was the portable drag saw - a straight bladed saw driven by a petrol engine used for cross cutting logs. Another was the mobile circular power saw ('swing saw'), sometimes called a 'Hargan's' saw after the main manufacturer. These saws could be run horizontally or vertically and were also able to straddle and rip cut logs (up to 60 centimetres in diameter in the case of the Hargan's 'Timber Chief'). This made them suitable for sleeper cutting though the full extent of their use for this purpose has not been possible to ascertain. They were used in Western Australia and for cutting red gum along the Murray, and iron-bark in the Pilliga region of New South Wales.

The first chainsaws appeared on the market in 1945. They required two men to operate them - one holding the motor end, the other a handle at the end of the bar to support and guide it. These were heavy, expensive and unreliable. Brands included 'Danarm', British 'Teles', Disston 'Mercury' (USA), I.E.L. (which marketed a one man model in 1947 and in 1949 began manufacturing in Australia). By 1949 the German 'Stihl' (possibly the world's first chainsaw manufacturer) was on the Australian market. Within a few years the two man saws had been replaced completely by lighter weight, better designed, more reliable one-man saws, mainly imported from the United States or Western Europe. Intensive cutting practices such as clearfelling could only be contemplated once such a technology was available. However, chainsaws also brought increased injuries to tree fallers and one response to this has been the hastening of development of feller-buncher and harvesting machines which enable fallers to operate the controls while machines do the heavy work remote from the operator (Humphreys 1980).

These new trends in tree felling were evident by 1980 with change being led by the softwood industry. While chainsaws remained the only felling equipment in hardwood forest in 1980, a range of highly mechanized harvesting equipment was appearing in the softwoods. These machines are suitable for any smallwood operation and are likely to be increasingly used in regrowth eucalypt forests. Some manufacturers are now advertising their machines directed to that market. These machines do not necessarily require spacious, well roaded plantations. Small feller-buncher machines are capable of operating in rugged terrain with restricted access. Labour productivity of 4 to 6 times that of chainsaw based techniques have been suggested with this new equipment (Kerruish 1980). Experiments with feller-buncher machines in thinning naturally regenerated

eucalypt forest are now in progress in Tasmania and elsewhere, as part of the Young Eucalypt Program.

Snigging to landing (loading ramp or log dump)

This section concerns the task of getting individual logs out of the forest and either stacking them for loading on rail or road transport to the mill, or delivering them directly to the small portable forest mills and 'spot' mills which have long been a feature of the Australian hardwood forest industry. In the first timber production era and the early part of the second, hauling logs direct to a forest mill was the most common form of operation.

The earliest transport of timber (flitches, slabs, bundles of shingles and palings) was on men's backs. At Port Arthur in Tasmania, convict 'centipedes' carried large logs out of the forest as part of their punishment, while the huon pine was extracted from the area around Macquarie Harbour on 'pine roads'. Logs were rolled and levered along cleared paths upon which skids had been laid (Dargavel 1988: 13). This technique was used elsewhere by cedar cutters to move logs to sawpits or to river banks. On steep slopes, the use of log chutes (or 'shoots') also was used at least by 1850 and possibly earlier. These were simply a gouged out groove, or were lined with logs parallel to the fall. Chutes were used throughout Australia but were only possible in steep country. While it later became more common to use steam winches and cables in steep country, some minor use of log chutes continued.

Bullock and horse teams were the major means of log snigging through a century of Australian timbergetting until World War II. Animal power was relatively cheap, flexible and, until the introduction of crawler tractors from the late 1930s, was only replaced by cable logging and high lead systems in valuable forests on steep country. Some use of bullock teams continued in the post-war period to finally peter out in the 1970s. Photographic evidence shows a mixture of both horse and bullock teams in log snigging throughout Australia. However, bullocks were generally favoured because they were better at hauling heavy loads over uneven ground or up steep inclines. They were cheaper to buy and maintain, being able to forage for themselves and did not require shoeing or expensive harness (Davison 1987: 78). They worked better in dense bush, not panicking when scratched by prickly plants, and easing around obstacles. Their main disadvantage was slowness, but this was not an important consideration when snigging relatively short distances in rough country.

In many areas (eg north Queensland rainforest, Bunya Mountains [Qld]) logs were simply snigged along the ground. To stop the nose of the log digging into the ground a shoe, slide or skid pan was fixed to the front end. Ground snigging was also used on soft and wet ground elsewhere and use of log shoes is recorded



Figure 3 Bullock team, Bulahdelah, NSW (Humphrey Collection, National Library of Australia)

in South Australia, Western Australia and Tasmania (for huon pine). Normally, however some form of wheeled device was used to raise the front of the log. This could be little more than a sturdy, rectangular length of wood with an adzed out top through which an axle ran to the wheels which were entirely wooden or carried iron bands. A forward facing pole connected the carriage to the team. The large end of the log could be chained to the axle by dropping the jinker wheels into holes dug into the ground on each side of the log (Mack 1985: 62). These 'jinkers' (not to be confused with a four wheel 'jinker') were used in all States. The other main type of device was the two wheeled logging arch to which logs were attached underneath. These found widespread use, but the largest were the 'whims' of Western Australia with diameters up to 3 metres (Mack 1985: 62 has a detailed description of their operation). These heavy, narrow tracked devices hauling large logs, created tremendous ground pressures and produced deep wheel ruts which soon became scoured out erosion gullies.

Steam power was to find two applications in snigging: cable logging (ground snigging), high lead, and skyline systems. The capital outlay for these systems especially the latter, restricted their use to high quality forests with a high concentration of merchantable logs over a limited area. They were especially useful in mountainous country, extending logging into areas which were inaccessible or uneconomic with conventional methods. Their use dates from approximately the turn of the century with ground snigging probably predating the raised systems. Both were powered by stationary steam engines, sometimes mounted on huge log skids which enabled them to haul themselves up the mountain side to their operating location. In ground snigging, logs being hauled needed a cleared path and horses or bullocks were used to bring logs to the cable pick-up. As well as hauling logs up slopes, winches could also be used to lower logs down to the landing. Ground snigging with cables was undertaken in the more rugged areas of forests in all states with the probable exception of South Australia. Cable lengths of 1.5 kilometres were recorded (Anon 1982).

High lead and skyline systems appear to have been used mainly in Tasmania and Victoria. Most were of the 'high lead' type which uses a spar tree to lift the log partly off the ground rather than the 'skyline' which lifts the log clear of the ground and the forest with head and tail spar. The Huon Timber Company at Geeveston, Tasmania used the latter system in the 1920s (Row 1980). Both systems have the advantage of minimum ground impact. However, in the Geeveston operation it was claimed that the system, with its swinging logs, destroyed as much timber as it retrieved. The high lead system is particularly suited to clearfelling, with cutting beginning near the winch and moving outwards. High leads were still in use in Southern Tasmanian eucalypt forests in 1980 (Kerruish 1985: 130).

Crawler tracks were developed for tanks in World War I and applied to tractors in the 1920s. The rate of adoption of crawler tractors in replacement of bullock and horse teams during the 1930s is unclear, but by the late 1930s they were well established. At the time most were probably owned by timber companies and large contractors. These machines were general purpose tractors and had to be modified for log extraction. Simply hauling logs on the ground or raised on small 2 wheeled jinkers was superseded before 1940 by purpose-built logging arches which had crawler tracks - as the rough Australian bush conditions ruined wheel bearings in pneumatic type models (McGrath 1956). Another major innovation was the fitting of winches. A number of British and American brands of crawler tractors were on the market in the pre- and post-war period but the American Caterpillar Company advertised its machines extensively as part of the war effort. After the war the fitting of dozer blades made the machines suitable for clearing and road making. This made possible the construction of logging roads into previously inaccessible areas or locations where costs would have prohibited timber extraction previously. Bulldozers with winches could snig logs out



Figure 4 Timberjack logging tractor. (National Library of Australia).

of the deep gullies in these areas and trucks could transport the logs along the roads. The logging sector now had at its disposal a formidable piece of technology, able to go almost anywhere, in a wide range of sizes, highly versatile, and able to reach the remote mountain areas to meet the post-war timber demands.

In 1963, purpose built rubber tyred 'skidders' were introduced for log snigging. These derived from the need for a low cost, highly productive machine capable of extracting timber at high speed over moderate terrain, whilst leaving the soil cover and residual stand relatively undisturbed (MacArthur 1981). They have been widely adopted in drier eucalypt forests. It is common for logging contractors to have a mix of wheeled and tracked machines. In fact, a range of machines are used for snigging and these have been classified by MacArthur (1981) in the following way:

- Agricultural or industrial tractors adapted to skid logs;
- Earth moving machines adapted for logging
 - . crawlers
 - . front-end loaders
- Log skidders
 - . rubber tyred
 - . high speed flexible tracked

In contrast to skidders which drag their partly suspended load, a new development dating from the early 1970s was the forest tractor or forwarder designed to carry a load (mainly small wood or shortwood) from stump to roadside. So far these have found their main application in softwood plantations but will be increasingly applicable to regrowth native forests. Considerable attention has been given in the 1980s to design improvements in these machines so as to minimize impacts on the environment (lessening soil compaction by the development of high flotation suspensions) and to improve operator ergonomics (and therefore their productivity). In general, this equipment derives from Western Europe and North America.

Loading and hauling to mill

Since early times, four main methods are identifiable in transporting logs from the bush landing or ramp to the mill: (a) water, (b) wagons hauled by horses and bullocks, (c) tramways and light railways, (d) motor trucks. Steam and road transport were significant technological changes. Both contributed to an enhanced ability to extend cutting deeper into the forests to extract timber more quickly and efficiently. However, there had to be sufficient concentrated timber resources to justify the investment, especially in the early period of steam power. Again, the practice of transporting logs directly from stump to mill must be noted. This practice relied on animal power and small portable or 'spot mills'. These were so-named because a flat side or 'spot' was manually prepared on one side of the log before sawing.

The use of water transport is an obvious and simple method of transporting logs but had two limitations: the availability of navigable streams and the ability of logs to float (hence the terms 'floaters' and 'sinkers'). For these two reasons, water transport has not had great application in Australia. Floating logs down coastal streams to be caught in a boom near the mouth was used for red cedar and hoop pine (New South Wales, Queensland) and huon pine (Tasmania). Ships (coastal steamers from 1850s) took logs from river mouths and inlets to city mills (east coast and Tasmania). Floating of logs (tied together in rafts towed by a boat) from Fraser Island to Maryborough, which occurred into the 1920s before being replaced by the use of punts, may have been the most exten-

sive use of this method. Other than Fraser Island, water transport by barge or punt was used on the north and south coast of New South Wales where 'droghers' winched logs aboard from riverside landings. The period of their use appears to have been from the late 19th century to the 1920s when the use of coastal steamers declined in the face of road and rail competition. The other major area was the Murray River where barges were used to transport red gum soon after exploitation of the forests began in the 1860s. Barges transported red gum logs in the water, attached to outriggers placed across the gunwales. This was possible because newly cut red gum is only slightly denser than water (Fahey 1988: 21).

As sawmilling became established after 1850, one of the investments made was in simple tramways to haul logs out of the forest. These were constructed with closely packed sleepers and wooden rails along which horse or bullock drawn trolleys carried logs. Their construction dates from the 1850s (or possibly 1840s) into the early period of this century (partly reflecting stages of regional development, eg 1850s - Tasmania (Graham, 1988), 1860s - West Gippsland (Woods Point, Walhalla), Victoria (Light Railway Research Society of Australia 1974), 1912 - Atherton Tableland (Pearson 1985) and there are instances of their use up to the 1940s, such as at Powelltown, Victoria (Stamford et al, 1984).

The tramway period which lasted until the 1940s (though some tramway use continued after the war) is closely associated with the construction of main line railways from the 1860s which made it physically and economically possible to transport sawn timber to metropolitan markets. As sawmilling expanded further into the forests so did the tramway network which increasingly used steam locomotives and steel rails. The first use of steam dates from the 1870s, recorded from Victoria and Western Australia.

The tramways were characterised by ingenuity and economy. Earthworks were kept to a minimum by the extensive use of timber trestles, gullies were spanned by tall but flimsy bridges, and on steep grades (beyond the ability of locomotives) steam winches were used (Light Railway Research Society of Australia 1974). After World War I, there were local variations on steam power with modification of petrol engine trucks and diesel tractors to run on rails.

Information on forest tramways is variable but some regions have been the subject of detailed research by the Light Railway Research Society of Australia. This is particularly the case for southern Victoria. Tramway expansion into the forest country of the wet ranges surrounding Melbourne dates from the 1860s but particular expansion of light steam railways occurred around the turn of the century. Areas covered include: the eastern Otway Ranges (Houghton 1975); Wombat Forest (Houghton 1980); Wandong (Light Railway Research Society 1974); Murrindindi Forest (Houghton 1986); Britannia Creek, Warburton

(Winzenreid 1986); Powelltown (Stamford et al. 1984); Gembrook (McCarthy 1987); Erica district (McCarthy 1983). Tramline routes tended to follow either river valleys or ridge tops so as to maintain a workable gradient. As timber was the main construction material in both the sawmilling towns and the tramways, most of these workings have been destroyed over the years by bushfires and decay.

In New South Wales, tramways were used along the escarpment forests mainly between 1900 and 1930 (Hannan 1986: 47). The largest and best known of these was the Langley Vale line in the Manning Valley, north of Taree, operating from 1890 (Brooker 1982). Some lines continued in use until after World War Two. A similar period of use occurred in southern Queensland, examples being Lahey's operation at Canungra (1900 - c. 1925) (Joyce 1966) and the tramways of Fraser Island (1905-1936) (Williams 1982). There is no record of steam powered light railways for north Queensland, probably because of the dispersed nature of the valuable trees and high level of cutting on private land prior to the 1950s. In Tasmania, an outstanding use of railways was the Huon Timber Company's construction of 65 kilometres of standard gauge (3 ft 6 ins) (1.07 metres) line into virgin forest west of Geeveston in southern Tasmania (Row 1980). The line, built at great expense to full engineering standards, operated until 1926 when the Company collapsed financially.

In Western Australia although horse and bullock drawn tramways were also used, a combination of easy terrain, the presence of two main timber species closely concentrated, and large company control, facilitated investment in the construction of standard gauge railways and use of large locomotives. The use of steam locomotives in the northern jarrah forests dates from 1872 (Mills 1989). As well as the application of steam to light and standard gauge rail, there were also experiments with the use of steam traction carriages (4-wheeled steam powered tractors) which towed log wagons or in one Western Australian case were constructed like a whim to carry a log slung underneath (Mills 1989). Through the whole of this tramway period, logs were also hauled throughout Australia by horse and bullock teams on, or under, 4-wheel wagons or jinkers.

The use of road transport for log hauling is closely associated with the development of the crawler tractor with blade and did not become fully established until after World War II. However, the first motor trucks were used in the 1920s - some being ex-Army relics of World War I. Typically they were 4-wheel drive (rear wheels chain driven), four cylinder petrol engined and had solid rubber tyres (Trautman and Trautman 1988; Mack 1985). Lack of power, poor brakes and poor traction with the solid tyres were problems with these early trucks - with braking and power remaining so until the 1960s. Nevertheless, trucks brought the ability to carry large loads and were as flexible as the limits of the road system - important features in the post-war period as logging spread

into remoter areas. Dual axle jinkers with the rear bogies capable of being carried 'pig-a-back' were available after the war and these attached to a diesel powered prime mover of 20-25 tonne capacity have become the standard hauling equipment throughout Australia. With the smaller, shorter logs now being used, there is a trend towards flat topped semi-trailers with 3-6 metre logs stacked in two bundles end to end. These trailers can be left free standing for loading by front-end loader or directly from a forwarder.

Loading of logs onto barges, wagons, railway trucks or 'bogies', and road transport trucks has been accomplished by three main means:

1. Lifting using a winch and derrick on a barge (or spar tree and jib in the bush). This relies on steam or other power source for the winch, and was used from about 1900 to 1940.
2. Cross hauling - either from a raised landing (eg onto railway trucks) or up a ramp (a large log against which have been placed smaller logs to act as skids). This method has been used since logs were first carried on 4-wheeled wagons or jinkers. Animal power could be used to pull the logs, however, in the steam era, stationary steam engines located at tramway sidings performed the task. In more recent times, dozer blades (pushing logs up the skids) or tractor mounted winches have been used.
3. Lifting with a front end loader fitted with log grabs. This is the common post-war method in sclerophyll forests.

Logging equipment: 1980s

Kerruish (1985) has summarized the main logging systems in sclerophyll forests of the east coast and Western Australia in the following way:

Native forests: dry sclerophyll

Under favourable conditions, wheeled machines are used for extracting and loading, logs being hauled in lengths of 3-12 metres to the mill. Such operations are common to much of the east coast and Western Australia where conditions permit. Tracked machines replace the wheeled skidders in steep terrain and contractors often operate a mix of wheeled and tracked machines. It is common practice to remove bark at the landing by hand debarking with some assistance from the machines. For much of the year the bark can be readily removed, but in dry periods it can be difficult and may seriously reduce production. With increasing demand for small wood for pulp and for the smaller, shorter logs used now for sawing, there is a trend towards the use of semi-trailers and the handling of logs in lengths of 3-6 m. Such operations can be seen in the jarrah forest (Western Australia) and in Victoria.

Native forests: wet sclerophyll

Tracked machines are the basis of the industry in the wetter and/or steeper forests common to Tasmania and parts of the east coast. Again, debarking is usually done on the landing. Recent introductions that have proven promising are the FMC flexible tracked skidder and hydraulic excavator based loaders. As well as being highly productive this combination of machines can reduce erosion. Cable systems, mostly Madill high leads, are used in the south of Tasmania to log steep, wet eucalypt forest.

Logging equipment in use across the Australian forest industries in the 1980s clearly shows the influence of terrain and type of material being harvested on equipment eg crawler tractors are much more evident in hardwood forest (rough, wet conditions, large logs) while forwarders are much more common in softwood plantations than native forest (easy terrain, small wood).

However, the trend in regrowth eucalypt forests will be towards similar equipment to that used in softwood plantations - although delays in adopting new technology are inevitable partly because of the considerable investment in existing machinery. Perhaps the most significant change will be the wider choice of harvesting systems. This choice is demonstrated by Wingate-Hill and MacArthur (1987) in examining the economics of debarking and chipping small-diameter regrowth eucalypt thinnings.

Summary: Logging technologies and cutting practices

There is some irony in the history of the Australian timber industry in that logging begins with the crudest of tools but takes the finest timbers, and ends (for our purposes) with sophisticated machinery, but with two-thirds of the roundwood removals being two undistinguished industrial products: hardwood woodchips and exotic softwoods.

The first manual period of logging was highly selective of the best species and best trees (eg 'free splitters', 'floaters', easy worked species such as red cedar) and occurred in the more easily accessible forests. Especially on the east coast, many of the areas cut were cleared for agriculture, and timber-getting was often a prelude to this.

The second sawmilling era (1850-1945) was the heyday of Australian sawmilling. There was no (or minimal) government regulation, apparently ample resources, increased infrastructure provision by the State (eg railways) and new technologies, which allowed logging to expand into more rugged forest country further from metropolitan centres. During this period, felling remained a manual activity - and it is not surprising that for this slow, strenuous task, cutters sought to cut only the valuable trees (ie ones without defect). This

process of selected individual trees, the best specimens of the best species, without much thought as to what would replace them. A century of doing this left many east coast forests with only old and badly formed trees of less favoured species, few desirable species, and a poor size class distribution. In some areas eg Victorian ash-type forests repeated incursions of fire had further degraded the timber resource and this remained the case well after World War Two. The latter part of the 19th century saw the widespread introduction of steam power into the forests for snigging and hauling. Very few parts of the forest were now inaccessible and intensity of cutting increased, supporting large numbers of small mills close to transport. The scale of operations varied regionally, from small tramways (many parts of east coast) to large standard gauge railways as in Western Australia.

The third era (from 1945) has been one of radical change in sawmilling and wood processing, as well as in all three parts of the logging sector. From the point of view of this study, the most important change in cutting practices has been the advent of hardwood clearfelling made possible by highly efficient modern logging equipment. Another important aspect of the post-war period was the expansion of logging into the remotest, formerly inaccessible areas made possible by the combination of crawler tractors and motor trucks.

The next major change will be the application of highly mechanized smallwood technology to the hardwood forests. In great contrast to logging methods of the past, this equipment will increasingly be engineered towards operator safety and comfort and environmental protection, as well as productivity. It should be noted however, that the environmental impact (eg soil compaction) of machinery operating throughout the forest is the subject of debate and perhaps insufficient research at this stage. The efficiency of this new equipment is already demonstrated in reduction in employment in felling and extraction over the last two decades, though total timber volumes have not significantly changed.

A summary diagram which links timber production eras, logging technologies and cutting practices and their regulation is shown in Figure 1.

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Glossary of logging terms

- Broad axe.** Wide bladed axe specially made for hewing timber by cutting along grain of wood.
- Cable logging (powered).** Use of steel cable to snig logs under mechanical power (steam, electric, internal combustion). Three main methods distinguished by cable and power unit:
Ground - cable close to ground level; High lead - uses spar tree to lift front of logs from ground;
Skyline - uses head and tail spars to lift logs clear of ground.
- Cant hook.** Hand tool with long handle used for moving or turning logs.
- Chute (shoot, slide).** A prepared route often trough shaped either on ground surface or parallel timbered, down which logs are sent by power or more commonly gravity.
- Cross hauling (loading).** Loading logs on to vehicles by rolling them up a ramp by means of cables or chains one end of which is made fast to the vehicle and the other passed under and round the log(s) to a winch or other source of traction.
- Double drum winch.** Used in cable logging. Separately controlled winches. One for drag line (cable that does actual hauling of log), other for haul back line or tail rope (of lighter gauge) which returns drag line. Sometimes tractor mounted.
- Floater.** Species of tree which when freshly felled, remains afloat in water. Opposite to 'Sinker'.
- Forwarder.** Purpose built tractor for carrying logs from forest to landing/trailers/ trucks for further transport. Has its own crane.
- Froe.** A long wedge shaped blade for splitting wood into shingles.
- Front-end loader.** A tractor-like machine fitted in front with devices, generally hydraulically activated, for picking up and loading eg grabs for roundwood.
- Flitch or cant.** A heavy piece of timber cut from a log in the first cuts through a breaking down saw. Usually with only two faces sawn.
- Jigger Board/Spring Board.** Board used in tree felling with iron wedge or 'shoe' where it is inserted into the tree.
- Jinker.** Trailer or wagon with two sets of wheels on which logs are loaded for haulage
- Kelly (slang).** Timber worker's term for standard Australian hardwood axe taken from original makers brand name.

Log shoe (slide or skid pan). Curved triangular wooden or iron plate fixed at head of log to assist in ground snigging of logs.

Logging arch. Strongly made, arched, steel frame mounted on wheels or tracks for use with tractor in snigging. One end of the log is slung beneath the arch.

Rake. A line of trucks on a timber tramway or railway.

Sawpit. A pit (sometimes dug, but also commonly a raised platform, often in a gully) to facilitate rip sawing of logs with a two-handed pit saw.

Scarf. V-shaped cut made in face of tree in direction of fall. Followed by back cut at rear slightly higher.

Topman (top dog). Sawyer who stands at top of sawpit above log to be sawn. Man below is underdog.

Sources: Dargavel 1988: 169-71; Society of American Foresters, 1983.

CHAPTER 12

ASSESSING HERITAGE VALUES OF SAWMILLS AND TRAMWAYS IN CENTRAL VICTORIA

Peter Evans

This paper describes the first intensive study of sawmill sites in the Rubicon State Forest to be carried out, and is funded by a National Estate Grant from the Australian Heritage Commission. During 1989, criteria for assigning heritage values to sawmill sites (based on the guidelines to the Burra Charter of Australia ICOMOS) were drawn up by Tom Griffiths and Ray Supple of the Historic Places Section of the then Department of Conservation, Forests and Lands. These were tested and applied to two sites intensively studied in January 1990 (see Evans 1992) before the start of a current pilot study in the Central Forest Management Area of Victoria. The area chosen to begin the survey was the Rubicon State Forest which was first logged in 1907, and is still being logged today.

Assembling individual mill histories

Individual mill histories for all sites in the first study area were assembled in sufficient detail to assist with the assessment of the mill sites and tramway systems. The primary source of information has been the surviving sawmill files of the Forests Commission of Victoria. These files provide starting and closure dates for the mills, output and other economic data as well as some technical data and maps of cutting areas and outlet tramways. Some contain only bare outlines, while others contain a wealth of detail often linked to the quality and depth of the reports and letters written by the individual forester or forests inspector. The files often do not provide maps of logging transportation systems as licences were not required for logging tramways, and these usually have to be checked on the ground. Newspapers were used to confirm dates, provide details of dramatic events such as fires and accidents, and occasionally some insight into the social life at the mill.

Where the sawmill in question was operating after the mid 1920s, oral history has provided some of the most valuable technical and social information obtained about sawmills in the region, especially as this usually provides detail

complementary to that obtained from official files. The accuracy of a person's memory varies from individual to individual, but much detail can be extracted which is unobtainable from any other source. Such people can also provide valuable historic photographs and sketch maps of the mill in question which assist enormously with the field work. It is important that oral histories from the bush sawmill era be collected as soon as possible due to the advanced age of most of the forest workers and their families from the period under study, before this information is lost forever. Since most of the sawmills of the period under review were operated by small family companies and partnerships, few detailed economic records, especially of the smaller mills, have survived.

From stump to sawdust - interpretation of the remains of bush sawmills

Forest sawmills were located close to their supply of timber to minimise transportation costs. A large amount of waste was generated by the milling process in the form of sawdust and timber which could not be economically processed into saleable sizes. Some of this waste could be utilized as fuel for the mill boilers, but most was simply burnt or dumped. This siting close to their resource meant that mills were often isolated, and as a result some developed sizable communities deep in the forest. At the less disturbed sites, remains can still be found of almost every industrial and social facet of the sawmilling process, and serve to help fill in the gaps in the documentary record.

Stumps and snig tracks

These remains start at the source of the timber, the tree. Tree-stumps dating from late last century can still be seen in the forest. Stumps, as well as indicating the density of the maturity of the forest during the milling period, also provide other signs of the timber extraction process. Apart from the familiar nicks in the stump to hold the boards used by the fallers to stand on, the stump may contain distinctive cuts placed by the fallers to wedge an axe or crosscut saw in the tree in order to sharpen these tools. If the top of the stump is not too decayed, the direction of fall can be ascertained from the position of the lower face of the scarf. Haulage or 'snig' tracks from the felled position of individual trees can be hard to detect, but due to the nature of steam winch snigging, these usually converge in a short distance to form a main snig route. The deep guttering caused by the passage of many logs is a distinctive and long-lasting feature which shows up well on early aerial photography and on the forest floor today.

Other features which often remain from this process are trees or stumps grooved with an axe to take a wire strop for a bullwheel used in the winching process. Often this strop was left behind when the bullwheel was moved, and sometimes

the bullwheel itself remained when the area was remote from the mill and was burnt out in a fire. Winch ropes were sometimes discarded in the bush when their working life had expired, and are relatively durable artefacts. Another indicator of the presence of winch ropes, especially along well-used routes, are scars cut into rocks alongside the snig track, a reminder of the hard use to which these ropes were put.



Figure 1 Substantially intact 12" bore by 24" stroke steam engine which powered a logging winch at the No.4 mill - an unusual and not very successful application for this type of engine. Photo: Peter Evans.

Landings and winches

On arrival at the landing the log was transferred to the log tramway trucks for its journey to the mill, except where the mill was newly established and the winch was sited at the log-yard. These landings, as well as steam winch settings, were constructed from substantial logs spiked or bolted together, and many have lasted extremely well. They are usually easily distinguished from more modern landings designed for motor trucks by their lower height to suit the tramway rolling-stock and the narrowness of the formation for the older transportation method.

The major exception in this case is for mills where the change-over from logging winches to crawler tractors is being made and the formation for the tramway may have been made by a crawler tractor with a blade instead of by manual methods. A careful search for other evidence will usually enable an accurate distinction to be made. Some steam winches were abandoned after the 1939 fires and can still be found in situ. Still others were used to haul logs to landings for motor trucks and were either abandoned when steam technology was discarded or were converted to diesel power and removed from the bush once cutting had ceased in that area.

Tramways

Very few tramways were laid flat on the ground with no earthworks at all. On any appreciable side slope a side-cutting can be observed. In rougher country deep cuttings were excavated through spurs and, in confined gullies, on the approaches to bridges. Earthworks of this type persist well except in very wet areas on steep side slopes where the 'flow' of the hillside can make them difficult to detect. In some cases, substantial timber tramway earthworks have persisted for over a century, and tramway formations have even been traced through cleared paddocks due to the presence of old fencelines or subtle changes in the colouration of the vegetation growing there today.

Most tramways associated with sawmills had wooden rails nailed to split wooden packing. The wide rail surface was of particular assistance in braking on steep downhill grades. The persistence of remnant features is largely dependant on the age of the tramway and the species of timber used in its construction. Rails were sawn and tended to be of the species which the mill was primarily cutting, albeit of a grade not commercially utilised due to faults in the timber. Packing for the tramway horses to walk on was usually split nearby and hauled only a short distance to the formation. If the tramway passed through a patch of messmate (*Eucalyptus obliqua*), patches of intact packing still remain from mills which closed in the 1920s. If the tramway was passing through mountain or alpine ash (*E. regnans* and *E. delegatensis*), very little sign of any wood construction will remain even from mills operating in the 1940s, although sleeper moulds are often evident in the formation. Where these moulds are widely spaced, some form of locomotive traction is indicated. Where the moulds are contiguous, horses were used.

Iron rails and fastenings provide more durable artefacts, and were often used in combination with wooden rails, especially on curves where friction and wear from wheel flanges was a problem. Rail remains range from simple flat iron strapping nailed to the upper surface of wooden rails, angle iron, light iron rail of the type used in mines, and heavy rail purchased second-hand from street tramways and government railways. Where the rail is missing, rail fastenings can help to determine the type of rail used. Sawmillers could seldom afford to

purchase new rail, and with the deep flanges and wide treads used on timber tramway rolling-stock there was seldom a need for high quality rail anyway.

Rolling-stock

Rolling-stock remains found in the bush are often the result of wear, accident or fire. They have been abandoned due to damage during their working life or the destruction of the tramway system which was the only means of retrieving them. Remains of tramway locomotives are rare, although large horseshoes are common, indicative of the size of the animals which did most of the haulage work.

Inclines

Another common element of timber tramway systems were inclines. These took the form of two-railed winch-operated haulages where the load had to ascend the incline, or three-railed gravity-operated lowering gears where the load had to descend the incline. While the valuable cast-iron wheels of the latter were often removed, isolated examples remain intact, and many still retain frames of heavy timbers in which the wheels were originally mounted.

Bridges

Often the most substantial engineering works on timber tramways were bridges. These took the form of low 'make-ups', often less than a metre high, and used to cross a low depression or swampy area where a conventional railway would use an earthen embankment. Simple bridges often consisted of no more than two substantial logs thrown over a creek or gully with cross-log or dry-stone walled abutments. Larger bridges fall broadly into three categories: 'trestles', the most elegantly engineered and consuming the least timber in their construction; 'pigsties', where the trestle support was replaced with square foundations built up from layers of logs; and 'crib-log' construction, where the bridge employed a network of solid timber supports from the rails almost to the bottom of the gully. The latter consumed the most timber in their construction, and often have substantial remains today.

Mill sites

Mill sites fall into two broad categories: those where the mill was shifted to a new site in the forest, and every re-usable item was moved on by the owners; and those which were burnt out by wildfire or simply abandoned by their owners when improved road transport and Forests Commission policy dictated that mills be located outside the forest areas. In the latter category, substantial remains can usually be expected, especially at the more isolated mill sites.

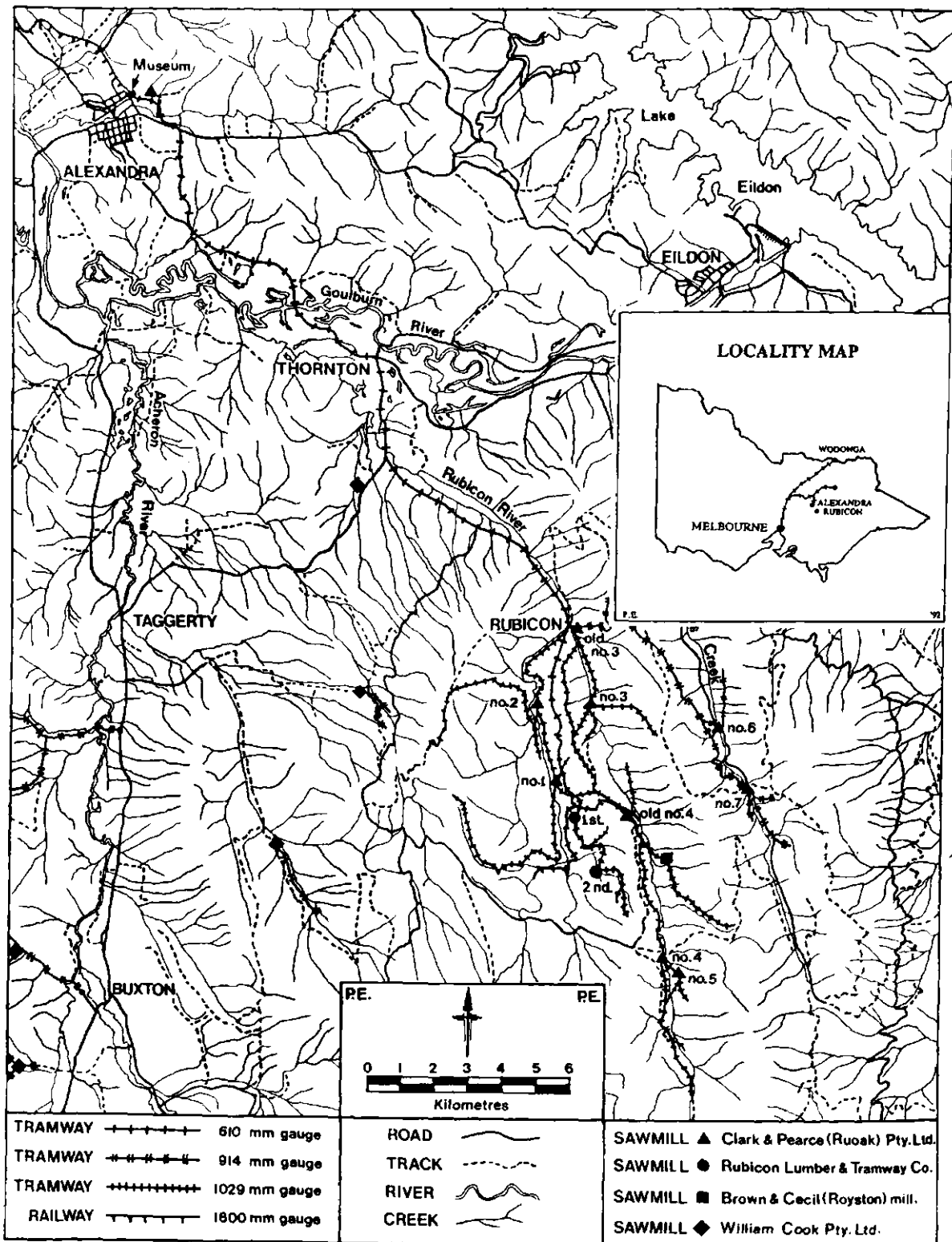


Figure 2 Sawmills and tramways of the Rubicon Forest 1907-1947

Breaking-down saw frames, bedlogs and roof pillars are often the most durable of the timber remains at the mill, and along with earthworks, enable the size of the mill shed to be readily determined. Sawdust trenches, machinery mounts, boiler settings and the slope of the terrain on which the mill was built help to determine the internal layout.

Most mills were powered by steam or, less commonly, water. Boilers are often found at the more remote sites, and where the actual boiler is missing, remains of the boiler setting will often help to determine the boiler type. Valuable information as to the working pressure, period of operation of the mill and clues to the boiler's previous history can be found stamped into the backhead or around the compensating ring of the manhole. The remains of the power-plant vary from foundations which enable an estimate of the size of the engine to be made to, in rare cases, the engine itself. Often, mills were powered by portable engines and the remains of these (usually minus all brass fittings and easily removable cast iron) are sometimes found. Other common machinery remains found at mill sites include shafting, belt-pulleys and discarded (often fire-buckled) saws. All these mill remains enable an estimate to be made of the size of the mill and the type of technology used.

A common requirement of Forests Commission sawmilling area licences in later years was the burning of sawdust residue from the mill. 'Green' sawdust does not burn well without a specially constructed retort and a strong draught, and earlier mills simply dumped the sawdust below the mill. These sawdust heaps, sometimes of considerable size, provide an evocative reminder of the amount of timber which passed through the mill, and seem almost immune to decay. They do however subside, and a measurement made from the top of a stump charred in the 1939 fires in the Rubicon Forest has indicated that a subsidence rate of three metres in 50 years has occurred at this location.

An important ancillary building associated with sawmills is the blacksmith's shop. The location of this is often indicated by piles of horseshoes and assorted metal objects, and sometimes by the remains of the forge, either in the form of bricks or the cast iron water jacket for the nozzle.

Remnants of outlet tramways are similar to those of the log tramways. Where the timber from the outlet tramway had to be transferred to motor truck, a gantry topped by a crabwinch on rails was a common method used to make the change-over. As these were generally built at the more recent mills, some still survive today. Other remains associated with early motor transport include bridges, board tracks and corduroy roads.

The mill settlement

The remains of the mill settlement help to determine the size and make-up of the mill community. The single men were housed in small huts arranged 'barrack'

fashion, often on the other side of the mill from the married couples who lived in larger houses. The ratio of each type of building, where these can be identified, helps to arrive at an understanding of the demography of the community. Contemporary photography and sketch-maps provided by oral sources are an invaluable aid in this identification. Where these are not available, a more careful assessment must be made of the form of each building and the artefacts present in the ruins.

The most common form of the building remains are fireplace stones and brickwork which once lined the inside of the large timber or corrugated iron chimneys. These fireplaces were often backed with a discarded saw blade or sheet of iron to reflect the heat. The persistence of timber remains once again depends on the age of the mill, whether it was simply abandoned or destroyed by fire, and the species of timber which the mill was cutting. Other common remains are glass, china, galvanised or cast iron and leather objects such as shoes and horse harness.

After the 1926 bushfires, the Forests Commission encouraged the construction of fire-refuge dugouts at sawmills. After the 1939 fires, they insisted. These refuges can still be identified today at most sites. While the roof may have collapsed, dry stone walling for the entrance and bearers for the earth filling making up the roof are common remains.

Field work

Survey of sawmill and tramway sites can be fairly simple where the site is readily accessible. Where it is not, several hours of trudging through thick bush may be required just to reach the mill site itself. Rates of progress along old tramway formations can be as slow as three hours to the kilometre, and an extensive mill site may take two days to survey with tape and compass in order to produce a reasonably accurate map of the remains. Where long tramway systems have to be walked, this process can be extended by several more days, and will more than likely include close contact with blackberry patches, stinging nettles, leeches, snakes, and the hazards of river crossings. Due to the altitude of most of the mountain ash mills, rain and snow are also common.

When the site investigation is completed, the size, power and technical sophistication of the sawmill (and its transportation network,) and the demography of its associated settlement can be assessed. This investigation should be carried out at the same time as the oral history where possible, as the field work will suggest new questions to be put to the oral sources, and maps in preparation and photographs of the remains will often jog the memory of the person and lead to fresh information being collected.

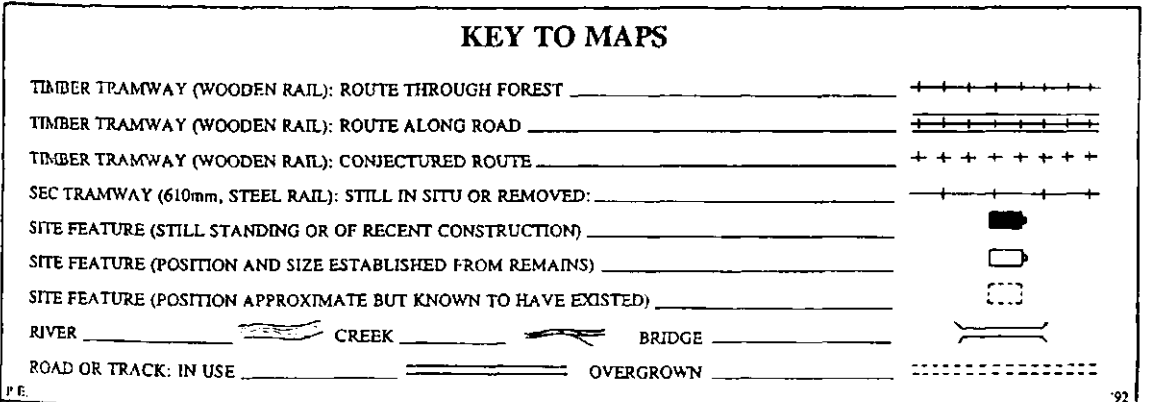
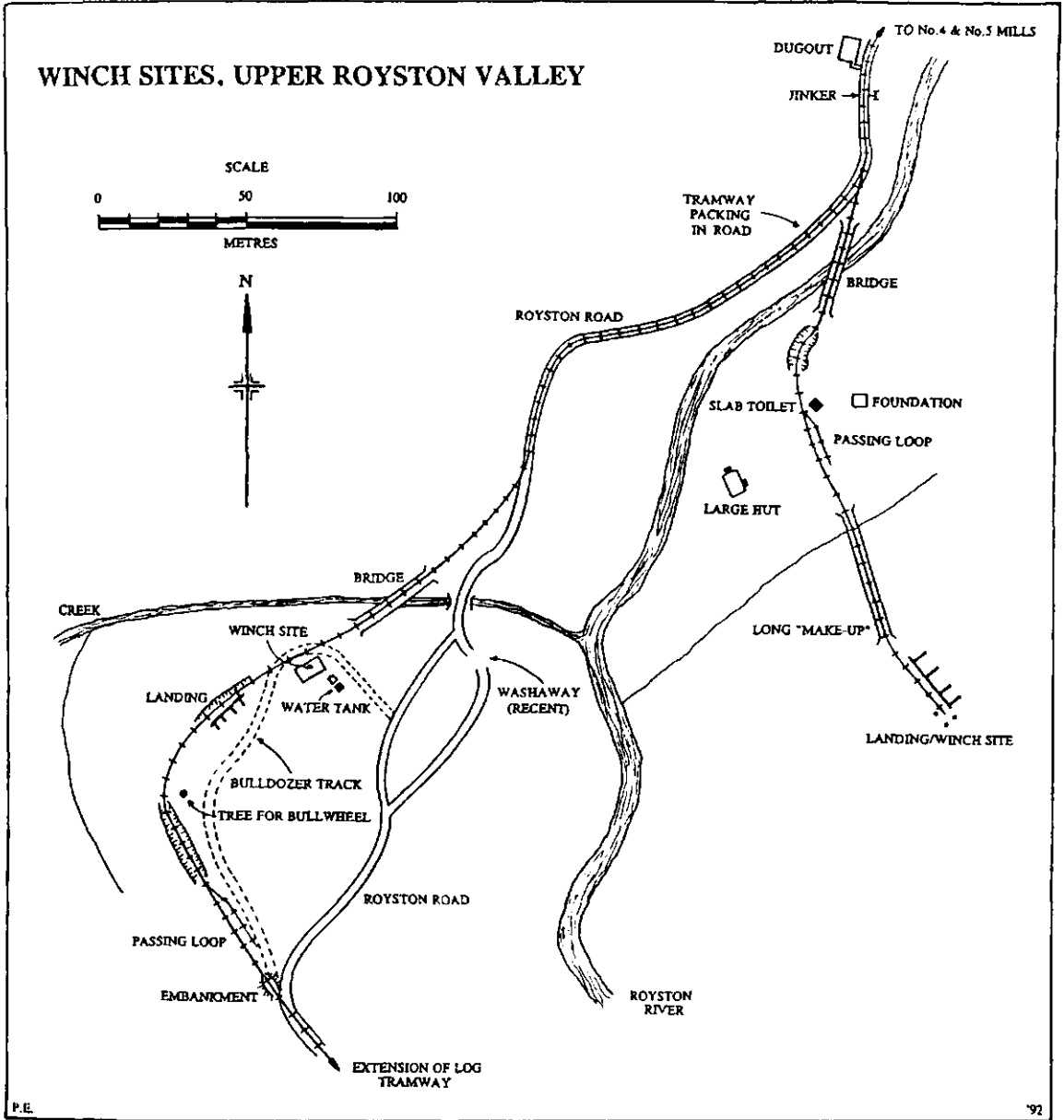


Figure 3 Winch sites, Upper Royston Valley.

Area chosen for the current study

The Rubicon Forest was chosen as the initial area for study. This forest contains the remains of twelve bush sawmills and an extensive tramway network. The mills cover the period from 1907 to 1953, were powered by water, steam and electricity, and ranged from small and primitive to large and efficient by the standards of the day. Logging techniques ranged from bullock team through steam winch to crawler tractor, and the forest ecology from its state before European disturbance to the post 1939 salvage era. The Rubicon Forest is still being logged, and provides a representative area for study where timber production has continued for over eighty-five years.

The tramway network is also diverse, consisting of a mixture of lightly laid lines worked by horses and motor tractor, and more robustly constructed lines worked by steam and diesel locomotives. Importantly, it also contains a range of gravity lowering gears with substantial remains, and which are of themselves worthy of study.

Beside timber extraction, the forest has also been subjected to other disturbances. Fire, grazing, tourism and the use of local water resources were studied in conjunction with the timber history of the region, and some elements of these must and have been included in the assessment of historic sites in the Rubicon Forest.

Assessment criteria

The sawmill site criteria already established by the Historic Places Section have been further tested, modified slightly, and arranged under the Criteria for the Register of the National Estate. (Australian Heritage Commission 1990). In each of the categories, attributes from the revised Historic Places Section criteria have been grouped and are shown in the Appendix to this paper. Some difficulty was experienced in deciding this grouping, and this list of attributes is by no means conclusive and may well be modified as more sites are surveyed. Two of the more important sites in the Rubicon Forest were chosen for the purposes comparing the results of the application of the criteria.

Clark & Kidd's 'Waterwheel' mill/Clark & Pearce No.1 mill

The first of these sites is the 'Waterwheel' mill opened in 1907 on the Rubicon River by Clark and Kidd, who were responsible for opening up the whole of the Rubicon Forest for timber production. This mill continued in operation on the same site until 10 January 1939 when it was destroyed by bushfire. Before 1939, none of the mills built by other companies after Clark and Kidd's in the upper Rubicon and Royston valleys could despatch any timber without using the pioneering tramway built by Clark and Kidd along the steep-walled valley of the

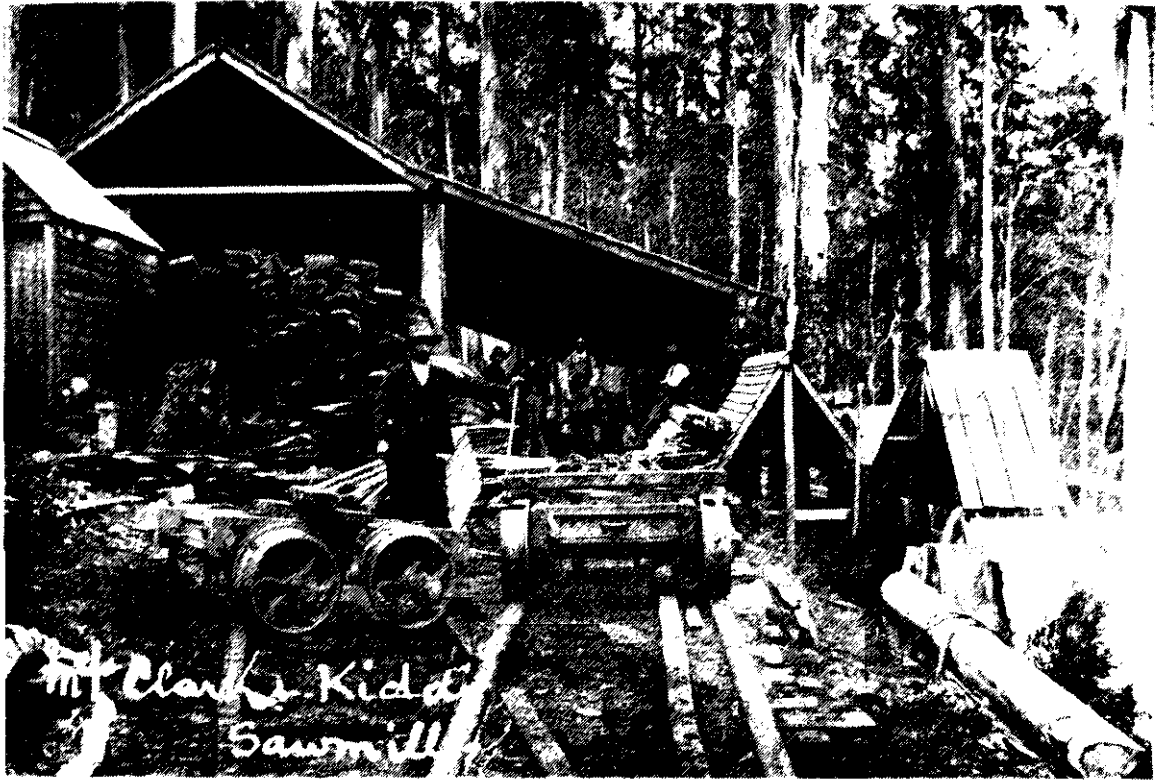


Figure 4 Clark and Kidd's "Waterwheel Mill" (Sometime after 1907 but before 1909 - the can in the left background is lettered "AR" for Alexander Road station indicating that the railway extension to Alexandra itself had not yet been completed). The Pelton wheel which powered the mill can be seen to the right of the picture.

Photo courtesy Alexandra Timber Tramway and Museum collection.

Rubicon River. (FCV 19/31, VPRS 1472-3). Being first in the region it was responsible for pioneering sawmilling deep into the Rubicon Forest, and it was long-lived by bush sawmill standards. The partnership of Clark and Kidd was also the precursor of Clark and Pearce/Ruoak Timbers Pty Ltd which came to dominate the sawmilling industry in the region through the profits earned from their successful seasoning and finishing works in Alexandra.

The mill was water-powered. A race was dug to tap a tributary of the Rubicon River, and this race fed a dam sited above the mill. This provided sufficient head of water to power a Pelton wheel developing 20 horsepower. Initially, the volume of the water supply was inadequate, but after the race was extended and the dam enlarged, the mill was able to cut between 5,000 and 6,000 super-feet

per day. This continued until 1930 when the State Electricity Commission (SECV) took over the water rights for their newly completed hydro-electricity scheme and supplied electricity to the mill at a cheap rate as compensation for the loss of the water. While bush sawmills powered by electricity are even rarer than those using water, the mill was in effect still getting its power from the same water source it had used since 1907, albeit in a different form. (FCV 19/31 and FCV 33/3308). In this way, the mill was a precursor to the SECV scheme, having proved the reliability of the water resources of the area over some years. An SECV surveyor is reputed to have stated that the mill's water race was the best piece of surveying he had seen considering that it had been carried out with 'boning rods'. The SECV race in operation today parallels it almost exactly. The mill's Pelton wheel was simply tipped over onto the sawdust heap at the mill and is still there somewhere beneath the sawdust from a further eight years milling (Ernie and Rose Le Brun 12 August 1986). The mill was therefore technically innovative. By comparison, most water powered sawmills relied on over-shot waterwheels and could not cut anything approaching 6,000 super-feet per day, nor did they achieve a life-span of some 31 years.

The mill (later known as Clark and Pearce No.1) also developed into the social centre of the forest. State School No.4031 was built at the mill in 1920 and operated until the mill was destroyed in 1939 (Blake 1973). The school, which had an enrolment of up to 22 pupils, also doubled as a hall for social evenings. The mill also boasted a tennis court and a small recreation ground for foot races and woodchopping competitions. Up to 100 people from this and neighbouring mills would have used these facilities (Ernie and Rose Le Brun 12 August 1986; Ike and Doris Sims 14 September 1991).

Obvious remains apart from the huge sawdust heap at the mill site are few, and the site has little aesthetic appeal, being heavily overgrown with blackberries and wire grass. However, patient searching is rewarded by the remains of a few houses (including that of the mill manager), the stumps once supporting the lower side of the school, the tennis court (complete with the posts for the net), the water supply dam at the head of the pipeline, and the route of the water race which is intact for the majority of its length. Both the logging and the outlet tramways have been converted into roads, although a good example of a double-drum steam logging-winch and dryback boiler are still in situ at the outer extremity of the log tramway.

Despite the lack of substantial remains, this mill is considered to be of State significance, and as it fulfils Australian Heritage Commission criteria A.4, C.2, D.2, F.1, and G.1, it will be recommended for inclusion on the Register of the National Estate.



Figure 5 Still standing in 1992 is this post which supported the net of the tennis court at the "Waterwheel" mill. Photo: Peter Evans.

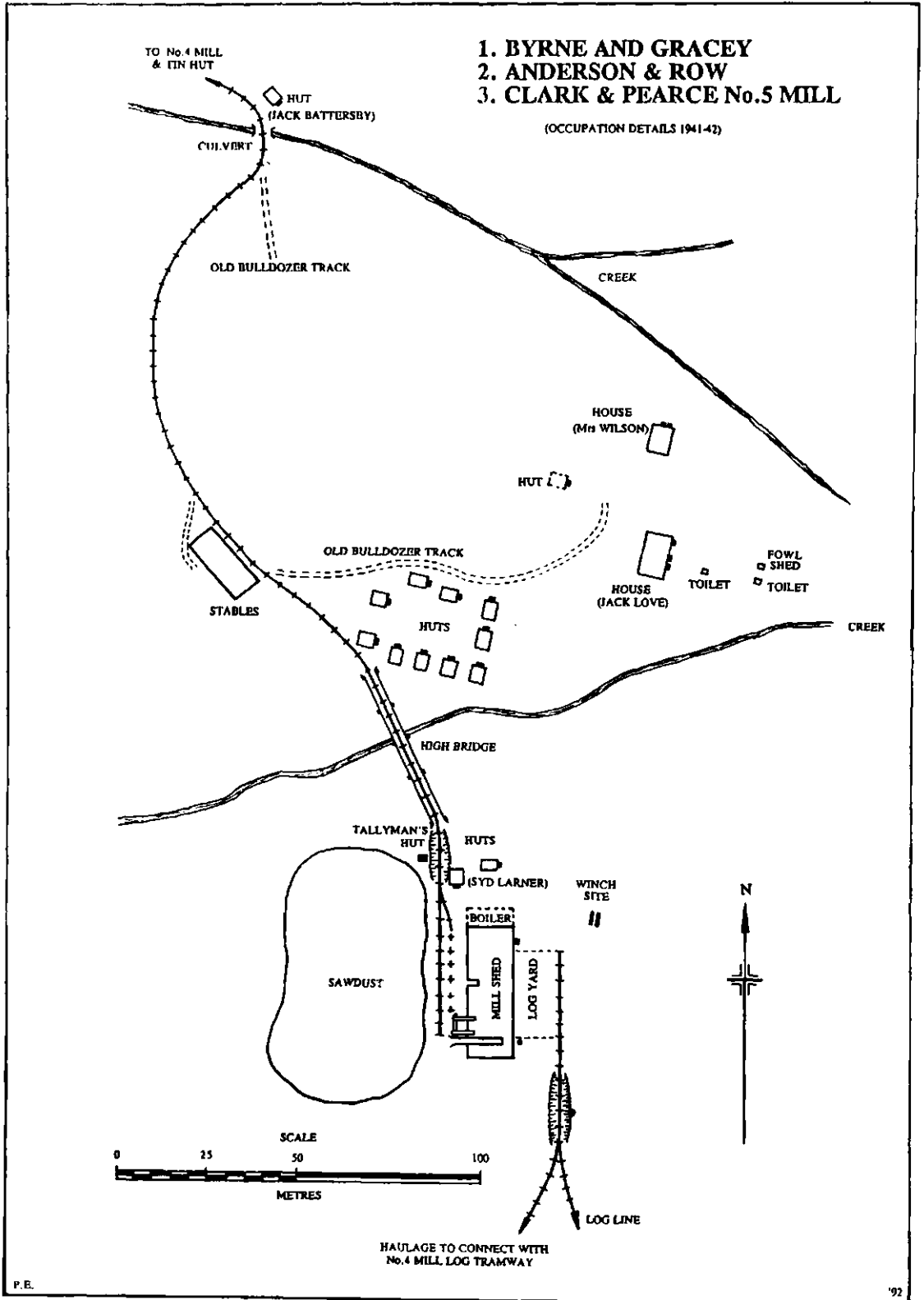


Figure 6 Mill locations.

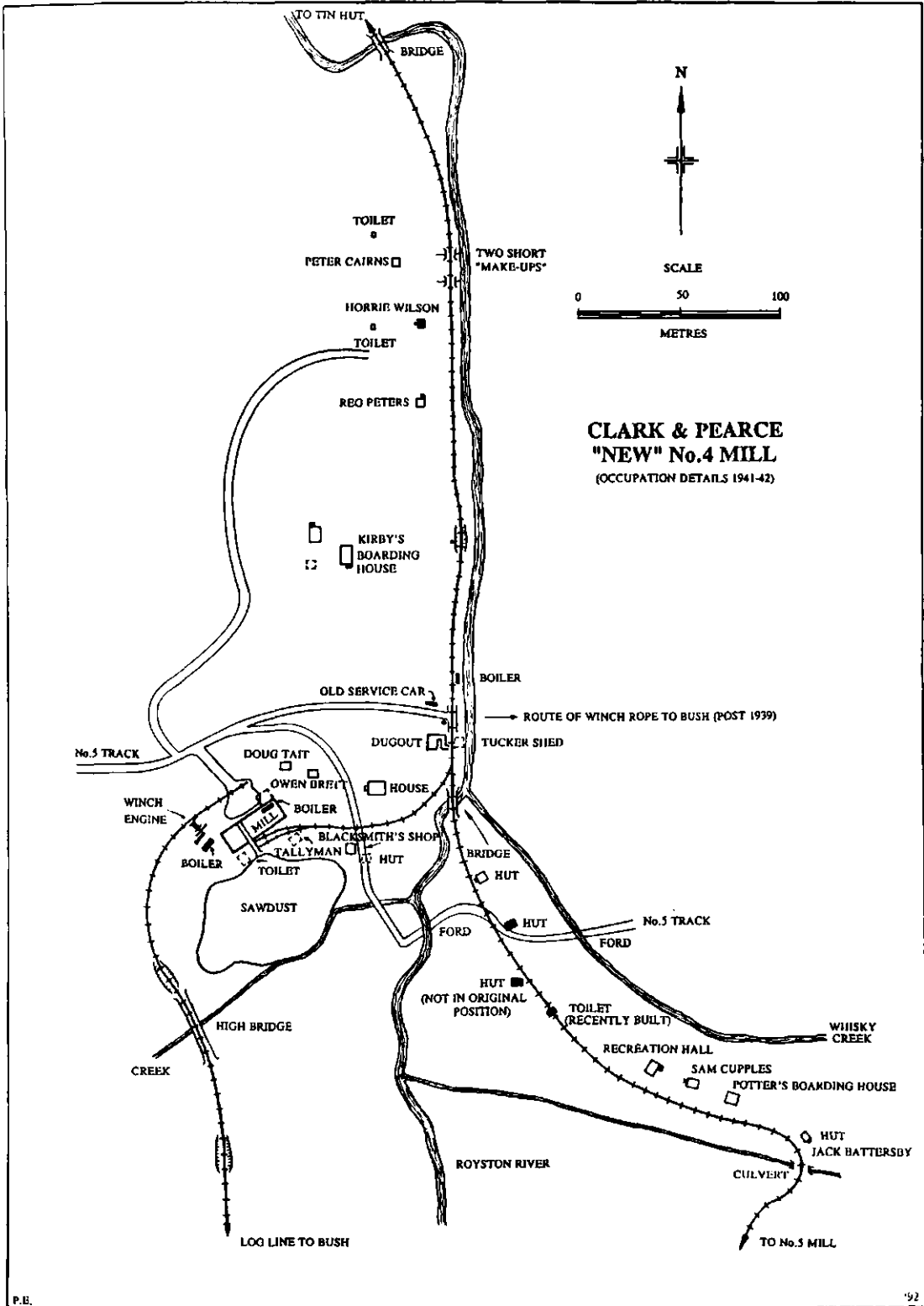


Figure 7 Mill locations.

Clark & Pearce 'New' No.4 and No.5 mill complex

The sites of Clark and Pearce No.4 and No.5 mills are situated close together in the upper Royston Valley, and will be considered as a single complex due to the layout and extent of the remains, and the fact that in later years they were worked together under common ownership and developed as a single community.

No. 5 mill began life as Byrne and Gracey's mill in February 1931. It was taken over by Anderson and Row (Marysville Timber and Seasoning Company) in January 1932, and by Clark and Pearce in March 1935. All three companies were important in the sawmilling industry: Byrne and Gracey at Murrindindi (Houghton 1986), Anderson and Row at Marysville (FCV 43/1967) and Clark and Pearce (Ruoak Timbers Pty Ltd) at Rubicon (FCV 33/190). The mill was destroyed by fire in 1939, was rebuilt, and closed in 1953 (FCV 49/243). It was therefore long-lived (22 years) and managed by regionally important owners. There was little technically innovative about the mill and its transport system.



Figure 8 No.4 Mill prior to 1939 fires. Photo courtesy Ike Sims.



Figure 9 No.5 Mill. Photo courtesy David Cairns.

No.4 mill was originally established further down the Royston Valley in January 1929 (Gerraty 1929) and was shifted to its final position near No.5 mill about November 1937 (Stretton 1939). No.4 was the only mill in the Rubicon Forest to escape the 1939 fires unscathed. The mill closed in 1953 along with No.5 (FCV 49/243). Once again, there was little technically innovative about the mill and its transport system.

Salvage logging in the forest burnt in the 1939 fires by Ruoak Timbers Pty Ltd (successors to Clark and Pearce) was concentrated in the Snobs Creek and Royston River valleys. Thus, the No.4 and No.5 mills became important in the salvage effort. Although most of the women and children previously living at the bush mills did not return to the forest after 1939, No.4 and No.5 replaced No.1 mill to some extent as the social centre. The mill boasted a recreation hall with billiard and table tennis tables, and an extensive settlement with some married couples and a preponderance of single men. When both mills were working, about 50 people would have been sharing this isolated location in the Upper Royston Valley (Fred Cupples 14 July 1992).

Although neither site was technically innovative, they were both typical of the bush sawmill of the period and significant in their later years for their ownership, output, contribution to the salvage effort, as a social centre, and as the last sawmills (apart from a small mill owned by the SECV) to operate in the Rubicon Forest. While the No.4 mill has little aesthetic appeal, to stand on the sawdust heap at No.5 mill and look across the valley surrounded by a lush regrowth forest is a very satisfying experience stemming from the natural beauty of the vista, awe at the immense size of the sawdust heap, and a sense of isolation in the high and remote Royston Valley. Both mills have extensive remains. These include boilers and boiler settings, and a substantially complete horizontal steam engine used for winching logs (an unusual application for this type of engine). Of the thirty-eight buildings positively located at the two sites, four are still standing and in reasonable condition, there are substantial remains of another seven, and all of the others demonstrate at least their size, form and orientation. Associated with both mills was an extensive log tramway network. Several winch sites have been located, one complete with a good example of the winch-drivers hut still standing. Of the tramway systems involved, a haulage complete with bridges and cable below the No.5 mill is substantially intact, and even where portions of the log tramway have been converted into a road, substantial evidence still remains of its former use.

These two sites are notable in that they and their associated transportation network demonstrate almost every facet of the 'stump to sawdust' process, and are an excellent example of the final bush mill period where the transition in technology from steam winch and tramway to crawler tractor and road transport is amply demonstrated. As this group of sites is of State significance, and fulfil Australian Heritage Commission Criteria A.2, C.2, D.2, E.1, and G.1, they are recommended for inclusion on the Register of the National Estate. Apart from the two sites described, one other site in the Rubicon Forest attains state significance, one site regional significance, and all others local significance.

Conservation and protection of sawmill sites

The majority of the relics associated with sawmill and tramway sites will biodegrade on a varying time-scale. Timber artefacts are decaying, and corrugated and wrought iron are gradually rusting away. The next fire through an area with standing buildings will reduce them to ash. Erosion, hillside 'flow', root disturbance and litter dropped from trees are gradually deforming and disguising the earthworks. Fossickers and machinery vandals are removing the more portable relics at all save the more remote sites. The only remains which will persist long into the future are the sawdust heaps, bricks, glass, cast iron, and, ironically, the remains of the mill resident's gardens. It is not economically feasible to intervene in these processes save at the most significant sites, and then this would be limited to preventative works such as providing repairs to the foundations of

machinery in danger of toppling. The most important thrust in providing a permanent reminder of this type of site is therefore to survey and record as many as possible before time erases much of the evidence. Apart from time, the most significant threat is re-logging. The bulldozer is the 'natural enemy' of the sawmill site and tramway route.

Where sites are being heavily used for recreational purposes, tramway formations are being eroded, post moulds and toilets used as rubbish pits, and artefacts redistributed as they are picked up, examined and discarded. Even where users, with the best of intentions, are 'maintaining' buildings, this is inevitably leading to disturbance and loss of the original fabric and the introduction of new materials. In an instance seen during this study, it would appear that one hut in a poor state has been dismantled in order to provide material to repair a second. Only interpretation of the site and education of users will help stem this process. Restricting vehicle access to some of the sites may protect machinery and artefacts too heavy to be removed by hand. As a last resort, the threat of legal action against known machinery vandals may have to be implemented.

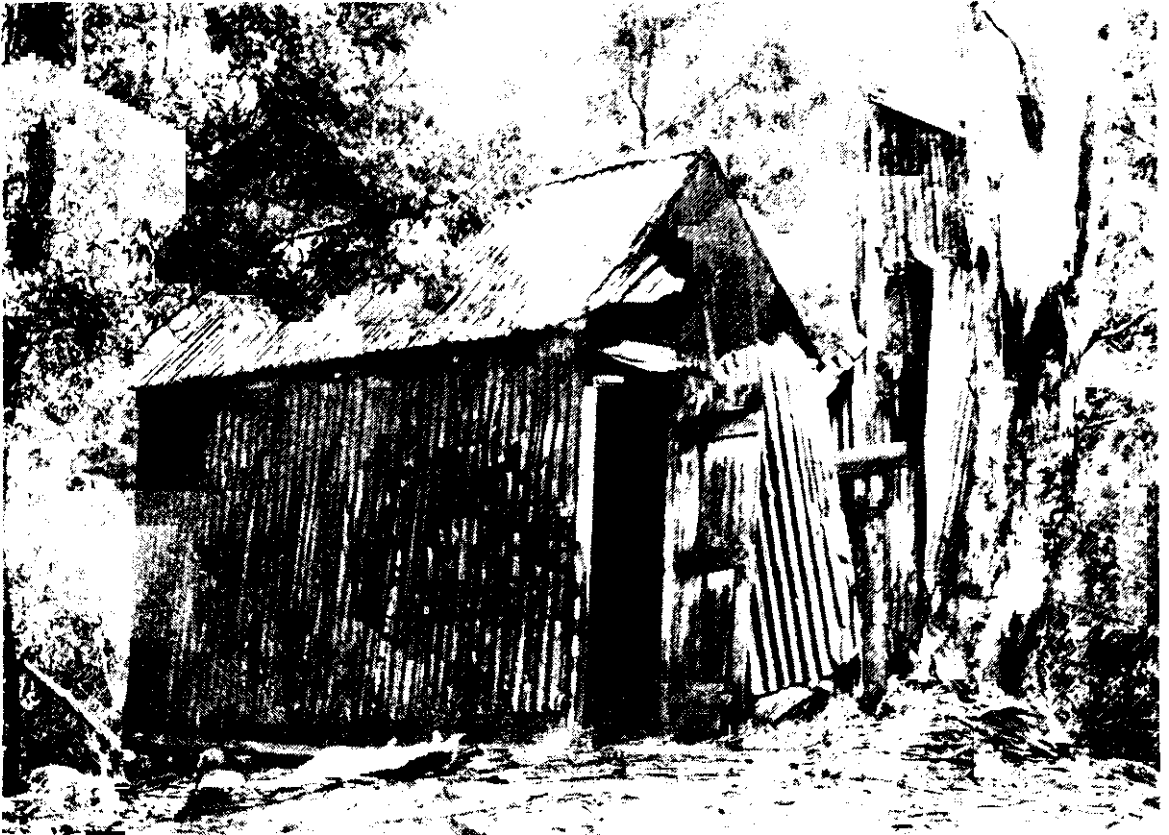


Figure 10 This hut once formed part of the No.4 and No.5 mill settlements. (It is now used by trail-bike and horse riders who appear to be "maintaining" it using materials from another hut which has been dismantled). Photo: Peter Evans.

Conclusion

Bush sawmill sites provide tangible evidence of an industry which has had, and continues to have, economic and cultural significance to many Australians. They are a valuable record of a way of life and a process which has been largely lost due to changes in social imperatives, timber extraction technology and the economic structure of the industry. As these sites will inevitably lose some evidence of their form and substance over time, it is important that as many as possible have their remains surveyed and their significance assessed.

Acknowledgment

The author wishes to acknowledge the important contribution made by Graham Perham of the Department of Conservation and Natural Resources to the field work carried out as part of this project.

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- (Interview dates given in text, tape and/or notes held by Historic Places Branch or by the author).
- Ernie and Rose le Brun: Ernie started at the Rubicon Lumber and Tramway Company's 'New' mill in 1927. When he married Rose, she came to live at the mill with him until it was destroyed by fire in 1939. Both were familiar with the other mills in the districts, especially the No.1 mill where they often went for social occasions or to play tennis.
- Ike and Doris Sims: Ike grew up at Clark and Pearce's No.2 and No.4 mills, and went to school at No.1 mill for a time. After the 1939 fires he worked at the 'New' No.4 mill and at the foot of the lowering gear from the Snobs Creek Mills. When this tramway was abandoned due to a road being constructed up the valley, he went to work at No.7 mill and later became 'bush-boss' for Ruok Timbers Pty Ltd. His wife Doris lived with him at the No.7 mill.
- Fred Cupples: Fred lived at the No.1 mill as a child, then after 1939, worked at the 'New' No.4 and the No.5 mill as a faller before going on to become a logging contractor.

APPENDIX: SAWMILL SITE CRITERIA GROUPED UNDER THE CRITERIA FOR THE REGISTER OF THE NATIONAL ESTATE

A.4 Importance for the site's association with events, developments or cultural phases which have had a significant role in the human occupation and evolution of the nation, state, region or community.

Was the sawmill and/or transportation network early in its region ?

Was its development work responsible for pioneering the industry in its region or initiating the development of other industries in the locality ?

Was the mill economically important, a large employer, or responsible for the development of a community in a remote location ?

Did an important event (eg. a major fire, discovery of a new seasoning process) occur there ?

Relative to other mills of the period in this locality, did it operate in the one place for a long time ?

B.2 Importance of the site in demonstrating a rare or distinctive way of life, custom, process, land-use, function or design no longer practised, in danger of being lost or of exceptional interest.

Does the site demonstrate an uncommon or rare way of life or organisation of a bush sawmill (such as the co-operative of returned soldiers formed to run the Lucknow mill at Warburton)?

Does the site demonstrate a rare harnessing of land-form or water resources for power or transportation?

Was the mill of rare or unusual layout?

C.2 Importance of the site for information contributing to a wider understanding of the history of human occupation of Australia.

Does the site demonstrate important facets in the development of sawmilling in Australia eg. does it represent a transitional period such a post-1939 salvage mill, or the last forest mill operated in a particular area?

Does the site demonstrate the change of timber extraction technology over a considerable period or represent successive occupations?

Does the site have a degree of archeological potential?

D.2 Importance of the site in demonstrating the principal characteristics of the range of human activities in the Australian environment (including way of life, custom, process, land-use, function, design or technique).

Does the site demonstrate the distinctive way of life, range of occupations and skills required in the timber extraction process?

Does the site demonstrate the distinctive methods of harnessing of natural landforms (eg. for use of gravity in transportation systems) and water sources (for power or transportation purposes) which were carried out at bush sawmills?

Does the site demonstrate well the distinctive layout typically associated with bush mills?

E.1 Importance of the site to a community for aesthetic characteristics held in high esteem or otherwise valued by the community.

Does the site today possess a sense of isolation and is its setting aesthetically pleasing ? (Sawmills in remote locations in an aesthetically pleasing regrowth forest would rate higher than a site beside a well-used road or in a recently re-logged area).

Do remnant buildings impart a sense of feeling for the community which once lived there?

Are the remains themselves of aesthetically pleasing form, eg. a sawdust kiln with decorative brickwork, or was the site the subject of a noted painting?

F.1 Importance of the site for demonstrating technical, creative, design or artistic excellence, innovation or achievement.

Was the sawmill technically innovative - did it use a new or unusual form of motive power or method of handling the timber (such as mechanised benches) at the mill?

Did it introduce machinery or methods of sawing which were unusual at the time or of a pioneering nature? (examples of this would include early band or gang saws).

Did it produce an unusual form of product (eg. barrel staves, or chemical products)?

Was it responsible for the introduction of new logging technology (eg. introduction of high-lead logging or skylines, early use of crawler tractors)?

Were its transportation systems particularly well surveyed or engineered?

Where bridges are involved, are they notable for a particular style of construction and do they represent an engineering achievement bearing in mind the technology available for their construction?

Does the site demonstrate the creative use of existing technology to overcome a particular problem?

G.1 Importance of the site as a place highly valued by a community for reasons of religious, spiritual or symbolic, cultural, educational, or social associations.

Is the site valued by retired timber workers and their families in the region as a symbolic place from their past?

Where timber is still an important industry in the region, does the site have symbolic importance to the current employees in the industry as imparting a sense of history or continuity to their daily working life?

Is the place valued by groups who regularly use the site today for its recreation value (eg, fishermen, bushwalkers and users of recreational vehicles), or who are employed in other industries located in the forest near the site?

H.1 Importance of the site for its close association with individuals whose activities have been significant in the history of the nation, state or region.

Is the site associated with a person renowned for activities other than sawmilling, eg. C.J. Dennis (writer) or Ned Kelly (bushranger)?

Was the owner of the sawmill an influential person in the region or important in politics?

Was the site associated with a person or company important in the development of the sawmilling industry either regionally or on a wider basis, or responsible for important technological breakthroughs in the industry not necessarily made at the site in question?

CHAPTER 13

TRACKING THE KTC FROM KAURI TO KARRI TO CHATLEE

Michael Roche, John Dargavel and Jenny Mills

Introduction

In 1988 the Kauri Timber Company (KTC) re-established an office in Auckland, 100 years after the company had been set up. Its history in the century between is one of specialised logging, varying competence, resource depletion, diversification and relocation. Its geography spanned New Zealand, Victoria, Western Australia, the Solomon Islands and Tasmania, and was linked to the United States of America and Denmark. All of this is touched on to some extent by company histories and other accounts (Carter 1974; Pink 1988; Simpson 1973). But KTC's history is also one rooted in the dynamics of business enterprise in which large firms eat small, and transnational corporations gobble national companies. It was played out against the backdrop of the internationalisation of capital from the late nineteenth century and the incorporation of peripheral regions into larger economies. KTC's history exemplifies such movements from its very establishment in 1888 in the wake of the collapse of Auckland's colonial economy, and through its subsequent search for further investment opportunities in New Zealand, its ventures into Western Australia and the Pacific, its unsuccessful attempts at diversification, its relocation into Tasmania, its withdrawal from New Zealand, and its eventual takeover by transnational corporations. This paper tracks KTC's peregrinations from resource to resource through these periods, and charts its take-overs of other firms that occurred, albeit with fits, starts and reversals, until it in turn was swallowed up by the giant Danish-based multinational corporation, East Asiatic.

Kauri, foremost children of *Tane*, God of the forests

At the time of large-scale European settlement in 1840, forests covered slightly over half of New Zealand. They contained kauri (*Agathis australis*) variously known in the early years of the nineteenth century as 'cowrie', 'kowie' and 'New Zealand pine', whose lightness, strength and straight grain made it particularly valued for masts and spars. It was a major resource, although twelve

other species of the genus also occur from Sumatra and Malaya to Fiji and from the Philippines to Queensland and New Zealand (Whitmore 1980). From the beginnings of European contact, the forests of North Auckland and the Coromandel Peninsula were exploited for masts and spars (McNab 1914) whose value so attracted the Admiralty that it endeavoured to set aside forest reserves in 1840-41 (Roche 1987). A log and sawn timber export trade, which began in the 1830s between northern New Zealand and New South Wales, continued into the mid-twentieth century by which time kauri resources had been virtually exhausted, and indigenous log exports prohibited.

Although in national terms timber did not make up a major proportion of colonial exports after the mid-1850s, kauri was a significant in Auckland's provincial economy: the sale of timber cutting rights provided revenue to the colonial authorities, the industry was a significant employer in the region, and the re-investment of profits from the Thames gold field by the city's merchant princes into industry, during the late 1860s and early 1870s, was part of a cycle of growth in the business economy (Stone 1973).

The kauri timber industry was distinguished from other important sawmilling districts in New Zealand by several specialised logging and sawmilling technologies it developed to handle the kauri trees. They were of considerable girth - one measured specimen had a circumference of 66 feet [20 metres] and was 100 feet [30 metres] to the first branch (Reed 1953), grew mainly on ridge tops and notably, floated well. By the 1870s the industry had developed the use of jacks to manoeuvre the large logs to water, constructed log driving dams which enabled the logs to be flushed down streams to coastal mills or to log booms where log rafts and 'scows' took them to mills on Auckland's waterfront (Eaddy 1939; Flude 1977; Leahy 1974). It was the sudden crash of the Auckland economy in the 1880s, in which the timber industry was centrally implicated, that provided the springboard for the formation of a new enterprise of unprecedented size, and complexity - the Kauri Timber Company.

A tale of two cities

The crisis which beset the Auckland business community in the late 1880s was not paralleled in Melbourne. There the 1880s were an era of growth and expansion in which population increased from 268 000 to 473 000 and there was an unprecedented demand for fine, easily worked softwood timber to build 'Marvellous Melbourne'. The city 'acquired an overwhelming hegemony in its region, a complex internal economy and a characteristically metropolitan ethos' (Davison 1978:p.7). Melbourne's financiers controlled pastoral stations and ventures as far away as sugar plantations in Queensland and Fiji, and made the city Australia's main entrepôt. Davison (1978:p.9) describes the financiers of

Collins and Queen Streets picturesquely as 'the faucet through which a torrent of British capital irrigated the entire Australasian and South Pacific region'. It was in this atmosphere of available capital, entrepreneurial spirit, an expanding construction sector, and unshakeable faith that economic growth was unassailable, that George Holdship and David Blair floated their proposal for a new timber company in New Zealand.

Business confidence, the expectation of continued urban growth (along with associated construction demand), and the prospect of being able to secure a dominant position in the kauri sawmilling industry were the key ingredients of the proposal. The two principals were the Auckland sawmiller, George Holdship, and a Melbourne timber merchant, David Blair. Holdship, a one-time goldfield carpenter, had expanded his business throughout the 1870s to form the Auckland Timber Company (nominal capital £60 000 in 1878). Blair's timber importing business included vessels sailing between Melbourne, New Guinea and New Zealand, and a sawmill in New Zealand. In the early 1880s he conceived the idea for a co-ordinated kauri sawmilling venture to supply Melbourne, but had been unable to induce New Zealand sawmillers to sell out before the Auckland crash. Blair was joined by Holdship, and by 1884 succeeded in recruiting prestigious Melbourne businessmen as directors, including Sir Frederick Sargood, unofficial leader of Victoria's Legislative Council and President of the Chamber of Commerce, Hon. James Balfour, also in the Legislative Council and insurance company director, and the energetic timber merchant, John Sharp.

In 1888 the scheme came to fruition as the Kauri Timber Company with a nominal capital set at £1.2 million which made it one of the largest financial ventures then operating in New Zealand. It purchased 28 sawmills from the crisis stricken kauri sawmillers (Figure 1) which it expected would enable it to produce 60 million super feet (141 600 cubic metres) annually of which 25 million (59 000 cubic metres) would be sold in Australia, with the remainder being sold in New Zealand and the Pacific Islands. About 80 per cent of the KTC capital was raised in Melbourne which was a sign of the vitality and confidence of the Melbourne business community in the continued growth (and profits) in their city, and in New Zealand as a source of exploitable natural resources. Melbourne's speculative property boom crashed, but the KTC managed to survive by writing down its capital in 1893, although by 1907 it was able to write them up again.

Meanwhile, similar but far larger demands for fine timber in Europe's swelling metropolises led to the formation of Det Ostasiatiske Kompagni - The East Asiatic Company - of Denmark in 1897. It was a shipping company which obtained concessions over teak forests in Thailand which it exploited for the European markets (Westphall 1972).

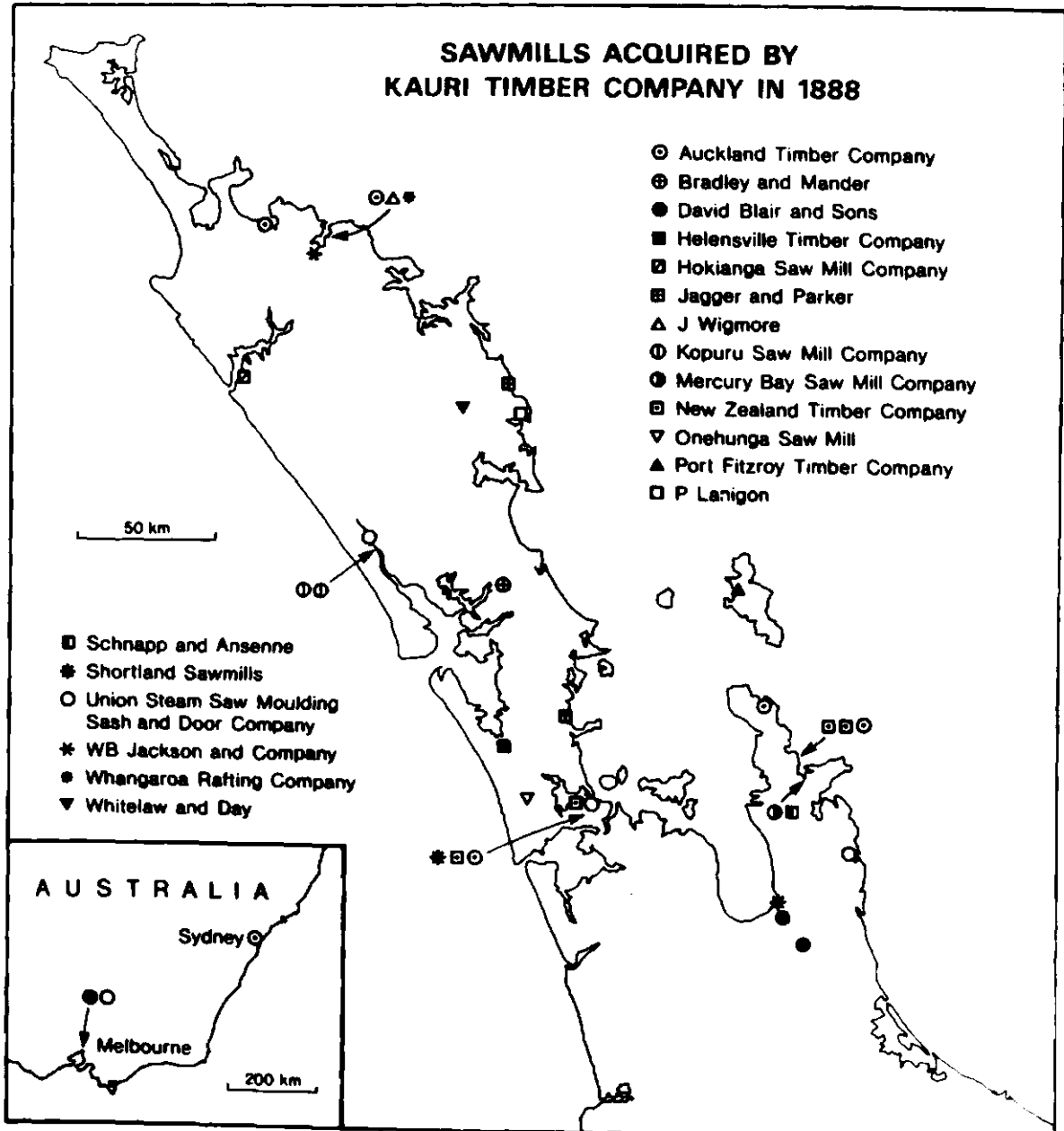


Figure 1 Sawmills acquired by Kauri Timber Company in 1888

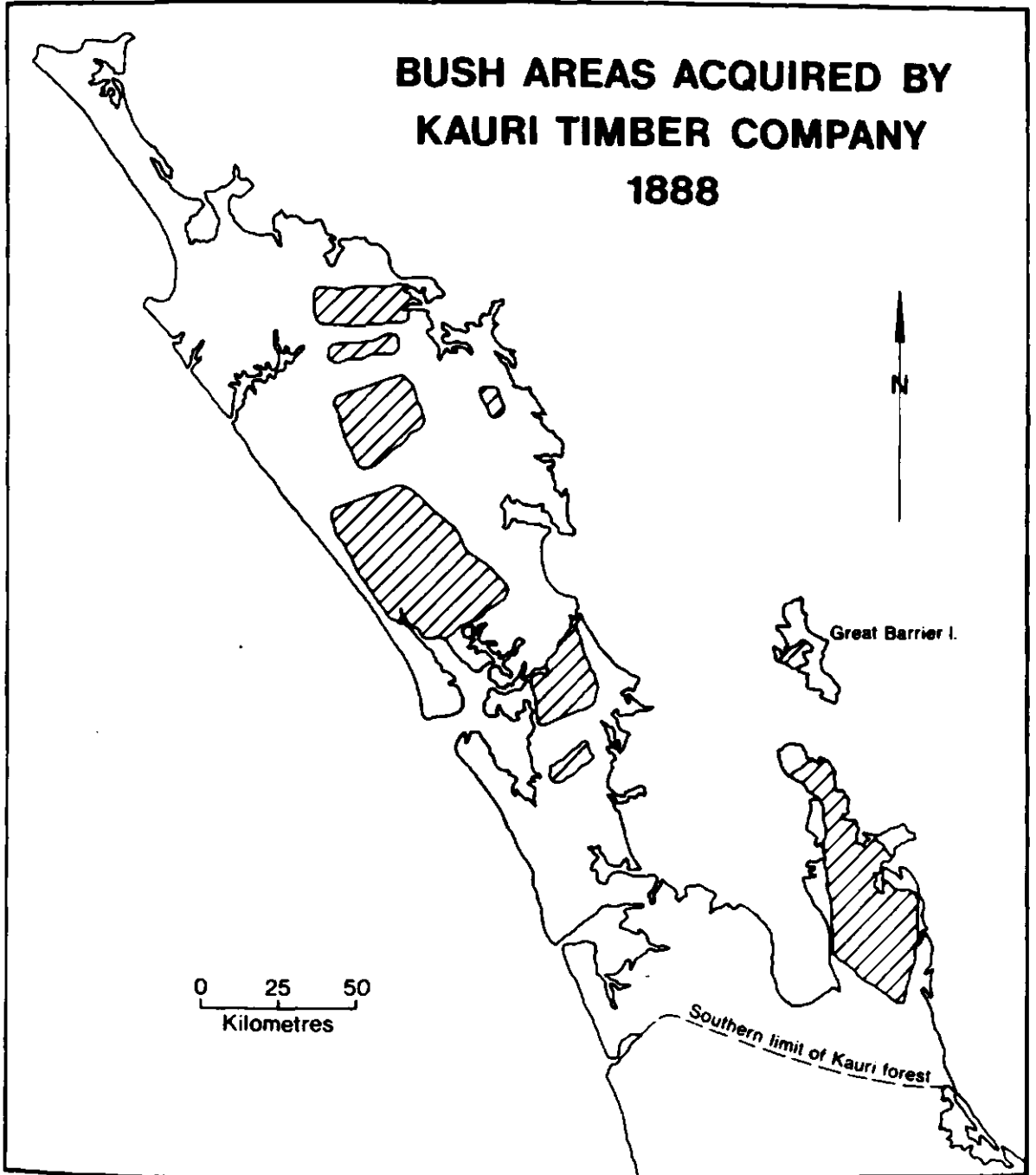


Figure 2 Bush areas acquired by Kauri Timber Company 1888

Infiltrating the New Zealand industry

The KTC was a gangling organisation. In 1888 it possessed 28 sawmills, cutting rights or ownership of 146 000 acres (59 000 hectares) of freehold, and 257 000 acres (104 000 hectares) of leasehold forest land, including kauri forests on Great Barrier Island (*N Z Herald*, 14 July 1888; Figure 2). Control was segmented with a New Zealand board, in charge of day to day sawmilling operations, reporting to a Melbourne board which sought to set overall company strategy. One of the strategies, and the intent or selling point of Holdship and Blair's proposal, was that the KTC would be able to exert monopoly control over kauri sawmilling in New Zealand. In this, it encountered many difficulties. Holdship, the entrepreneur, had the skills to sell the scheme, but not to manage the new organisation, and he clashed with the Melbourne board. The size of the new organisation posed new operational and financial problems. To keep the sawmills cutting to capacity meant ensuring log supplies, through a complex chain from hilltop forests, down driving creeks, into log rafts, transport to the mills, production, despatch and sales. Any number of links in the chain could break and for many reasons. For example, a wet year in 1902 flushed down logs that had been stranded in creeks for several years, thus creating a surfeit. When faulty estimates of quantities being felled were made, logs broke through the booms. Furthermore the rudimentary tallying and accounting procedures, used by many of the individually-owned plants, proved inadequate to meet the needs of a large transnational company.

Perhaps more importantly, a new generation of competing kauri sawmills were set up in the 1890s. These had experienced staff, working with newer plant and equipment, who benefited significantly from Government actions aimed at preventing the KTC becoming the monopoly supplier of kauri timber. Initially the KTC tried to drive its competitors out of business by purchasing timber cutting rights on areas adjacent to their mills: principally those of the Leyland O'Brien Timber Co., Goldie & Co., Mitchelson Timber Co., Mander and Bradley, and F. W. Mathews. One longer term consequence of this was the difficulty of actually felling the timber before the cutting rights lapsed. Even in the colonial context, the KTC's origins in Victoria meant that it faced special attention from New Zealand sawmillers as an 'outsider' and as something of a threat to the local industry. KTC's strategy only succeeded in pushing the government to put more kauri forests up for tender. By 1894 KTC was forced to accept that it would not be able to drive its competitors out of business by purchasing timber cutting rights. A private members' bill proposing anti-monopoly measures, although it lapsed, provided a further warning to the KTC. New kauri sales regulations were eventually introduced in 1903 enabling the government to replace the auction system with a tender system, a mechanism through which the state divided its kauri forests amongst a number of leading companies.

Having failed to drive out the competition the KTC then changed tactics and sought instead to enter into a range of price fixing agreements with its major competitors. Serious discussions about such a combine date from 1894. In various forms agreements were reached with a number of competitors over the next six years, exemplified by the joint shareholding of KTC and Mitchelson Timber Coy in the White Pine Timber Co.

By 1899 it had also become clear to the KTC that its own kauri reserves were finite and indeed that the remaining kauri forests in New Zealand were far from being inexhaustible. KTC estimated 4 to 15 years life ahead of its various sawmills in 1899 based on 376 million super feet (1.1 million cubic metres) on freehold forest and 438 million super feet (1.3 million cubic metres) on leasehold land. In the years that followed the Department of Lands and Survey made a series of national estimates of timber supplies. These suggested that 448 million super feet of kauri remained on Crown land with somewhat more, 663 million (2 million cubic metres) remaining on private or Maori land. It was further suggested by Lands Department officials that merchantable supplies of all timbers would be cut out in 70 years' time (ie by 1975) (AJHR 1905: C4, 2). Kauri was regarded as especially scarce, and likely to be cut out within 20 years (AJHR 1901:C1, ix). By 1910, KTC was vigorously milling on Great Barrier Island, one of its more distant forest holdings.

Consequently, in the latter years of the 19th century the KTC was faced with the decision of whether to fell its kauri to exhaustion at its current rate, or to diversify into general sawmilling in New Zealand. By 1900 it had clearly chosen the latter. It made the transition into two stages. First, it became involved in the kahikatea (*Dacrycarpus dacrydioides*) and rimu (*Podocarpus cupressinum*) trades. Kahikatea, or white pine, was an important export to Australia where its clean, odourless timber was used for butter boxes. Rimu was the predominant timber species in the country but was only ranked second for its quality. Second, KTC began to diversify by systematically buying interests in other companies, initially within North Auckland and later across the whole country (Table 1).

The White Pine Company which had been established by William and Joseph Butler at Wairoa held cutting rights to over 97 million super feet (292 000 cubic metres) of kahikatea and 0.3 million (900 cubic metres) of kauri, which was expected to last until 1920. The KTC took 3 000 of the 14 000 £1 shares in 1902, but raised their holding to 50 per cent when the Butler brothers sold out in 1907.

In 1904 KTC offered to take a 50 per cent shareholding in Ellis and Burnand which was centred in the King Country and dated back to the 1880s. Ellis and Burnand's Chairman supported KTC's overtures because 'it would enable our company to very largely increase its output and resulting profit' (KTC Archives,

Table 1 New Zealand subsidiaries of the Kauri Timber Company 1900-1948

Name	Established	KTC Purchased	Share	Operations
White Pine	1900	1902	50%	Northland Timber Co.
Ellis & Burnard	1903	1904	50% by 1907	King Country
Butler Bros	1909	1909	48%	Westland
Stuart & Chapman	1903	1915	66%	Westland
George Syme & Co.?	1945	100%	?	Taranaki and Bay of Plenty
W Booth & Co.	1909	1945	?	Wellington
Steele Bros	1922	1956	100% since 1938	Bay of Plenty
N Z Plywoods	1948	1948	50%	Christchurch
Matai Timbers	1939	1939	100%	Bay of Plenty
Red Pine Timber	1939	1939	80% 100% by 1955	Bay of Plenty

Source: Kauri Correspondence NZ Subsidiaries 1955-56 - Melbourne University Archives.

Note: Company establishment dates are given. Some operations have a much older existence, for example, Booth (1873), Ellis (1886), Steele (1888), Stuart and Chapman (1890).

Univ. Melbourne, Box T). In the process KTC increased its capital from £22 000 to £50 000, regarding it as a firm with prospects but under-capitalised. The former at least was achieved. The output of rimu and totara was increased from 10 million to 41 million super feet (from 24 000 to 97 000 cubic metres) between 1906/7 and 1912/13 (Collier 1919). The company was centred on Hamilton, where it built a sash and door mill and a box factory, and operated bush sawmills at Otorohanga, Mangapehi, and Mananui. In 1909 it estimated its forest resources at about 195 million super feet (587 000 cubic metres) which it thought would last for up to 25 years.

Other firms purchased by KTC included a 48 per cent shareholding in the sawmill Butler Bros built with up-to-date equipment at Ruatapu in 1909 (after they had sold out of the White Pine Co). Unlike the very short term cutting agreements that characterised the New Zealand timber industry, their operation was based on long term security in two 14 000 acre [5670 hectare] blocks, mainly of rimu. Their development challenges McCaskill's (1960) view that the Westland timber industry was a product primarily of local capital, with some from Canterbury and technical skills from Southland. In turn, some of these companies had their own subsidiaries. For example, the Butler Timber Coy Ltd (1927) ran a Christchurch timber yard and the Ellis Veneer Co. (1911) pioneered veneer manufacture in New Zealand. These series of take-overs kept the KTC big enough to be able to obtain various commercial advantages. As Justice Schutt observed in a case relating to an Australian competitor (Gunnensens), the KTC 'carrying out a very extensive business indeed, was in a more favourable position than its competitors with regard to the securing of freight' (Ormond & Another v. Gunnensen, cited in Dominion Federated Sawmillers Association. Minutes, 17-19, Jan 1921. ANU Archives).

KTC also took an increasing interest in Steele Bros. This firm had began in 1888 as a family-based milling operation cutting on Maori leasehold forest on the Mamaku plateau. It had acquired additional forests in the 1920s and modernised the plant. When George Steele died in 1934, KTC acquired his shares and became actively involved in management. By 1950 they had purchased the remainder of the Steele family's shares. However, Steele Bros was one of KTC's less successful acquisitions. Its own timber reserves were cut out in the 1940s, it became dependent on State Forest Service timber, and faced labour problems. Milling operations ceased in 1954 (Anon 1954).

In 1941 the KTC cut the last of its kauri on Great Barrier Island (Anon 1941) and in 1949 the last of its kauri in New Zealand. An era in the New Zealand timber industry was coming to a close.

Investing in Western Australia

Although KTC's timber resources were depleting, profits rose from 1900 to the extent that it looked for new investments beyond New Zealand. As the Chairman reported to the annual meeting in 1912, the company's financial position was so good it would have had to consider a return of capital unless it could find prospects for investment. 'However, the purchase of the Western Australian Jarrah Sawmills Ltd at Barabup would provide an outlet for accumulated funds and prolong the company's corporate existence.' (cited by Carter 1972). It was an attractive investment. The very durable Western Australian hardwoods, jarrah (*Eucalyptus marginata*) and karri (*E. diversicolor*), were being exported worldwide in increasing quantities for railway sleepers, paving blocks, telegraph poles and heavy section timbers. Although the mighty Millars combine, formed in 1902, dominated the trade, the political climate and expanding markets were propitious. Labor, led by 'Happy' Jack Scaddon, came to power in the State elections in 1911. He immediately established state sawmills to take advantage of the lucrative export market and the building of the Transcontinental Railway. Permit areas were opened up in the forests of the Manjimup-Pemberton area to provide jarrah and treated karri sleepers for this venture.

The company brought Robert Smith from New Zealand to be their General Manager in Western Australia. His father, William, had probably worked as a saw-doctor for George Holdship's Auckland Timber Company before it was taken over by the KTC. Robert Smith, the third of William's six children, was born at Thames in 1874. He began working for the KTC about 1898 and in that year he married Emma Elizabeth Garton. They had five children and lived in Auckland until they came to Western Australia in 1912 where he became known as Robert Garton Smith, or Robert 'Riverton' Smith after the beautiful 'Riverton' farm, near Balingup, where he lived for many years (interview R Garton Smith and Hawson).

The KTC bought the Barabup sawmill on the Blackwood River near Nannup from Bartram and Sons of Melbourne, who traded as WA Sawmills & Co. It was an attractive purchase with a large, three year old mill, employing 150 men, and had its own forest permit area (W.A. Jarrah Sawmills, Forest Department files, WA State Archives). Bartrams also had a sawmill at Kirup and, by guaranteeing certain yearly wharfage fees, persuaded the government to extend Busselton's long jetty into deeper sea at a cost of \$30,000. This arrangement was taken over by the KTC and the work was carried on for ten years. The jetty was one mile long and could load ships either side (Thomas 1938). Busselton was connected to Nannup by a new railway line.

The KTC soon expanded by building a new mill of similar capacity at Ellis Creek, halfway between Nannup and Bridgetown, in a karri forest permit area. This was the first log bandmill of an up-to-date American type in Western

Australia (Thomas 1938). Robert Garton Smith's brother, Jack, also an experienced saw-doctor, managed the Ellis Creek mill.

Robert Garton Smith was a fine upstanding man who commanded respect among his staff and workers (Court 1992). His name soon appeared in the minutes of the Timber Merchants and later Sawmills Associations side by side with representatives from Millars, Whittakers, Bunnings and other members. However the KTC did not have a Perth base although it later bought the Maylands yard belonging to timber merchant, J.C. Port, which it leased to another sawmiller (Stoate 1950). Both KTC and Millars were run by distant Boards. The KTC with an Australian Board seemed to be kept under tighter control than the London-run Millars which fitted into the local scene more easily and was vertically integrated into the State.

The industry boomed from 1909 to 1913 but was badly affected by World War I with the loss of overseas markets, trade union troubles, lack of labour and a shortage of shipping. The Ellis Creek mill was one of the few that managed to keep working throughout the war (Thomas 1938). After the war business began to pick up and by the mid-1920s there was a great overseas and interstate demand for hewn and sawn sleepers and heavy section timbers. With changing resources and markets, KTC reorganised its production capacity. The Great Barrier Island sawmill in New Zealand was closed and its log bandsaw installed in a new mill built in Nannup in 1920. The boom was short-lived, and the Ellis Creek mill was dismantled in 1926 and its equipment sent to a new mill built in Melbourne (see below).

In 1927 Conservator Kessell sought to reduce and regulate the cut in the karri and jarrah forests in order to prolong the life of the industry and provide continuous employment in the timber towns. He encouraged the industry to move from the overcut Northern Jarrah Forest to the Lower South-west region, and wanted the companies to become vertically integrated. Millars, the State Sawmills and Bunning Bros all agreed, but no reduction was imposed on the KTC because it was already taking less than its permissible intake. However, the KTC later erected another sawmill at Willow Springs against the wishes of the Forest Department and increased the company's overall cut (Stoate 1950).

The Great Depression of the 1930s caused another slump in the industry, made worse by competition from the eastern States, over-production and price cutting in desperate attempts to secure overseas markets. The situation was partially alleviated by new large-scale mining in the Kalgoorlie and Murchison goldfields which demanded timber for mining sets and housing. Once the demand for export sleepers began to increase, Kessell encouraged the various WA companies to form export pools so that one good contract could be met with adequate timber. It appears that the KTC did not join until many years later (Ward 1992).

World War II intervened and once more the industry was hampered by loss of valuable overseas markets, lack of shipping and of labour. Sawmills became old, run down and were forced to 'cannibalise' equipment from some mills in order to keep others going. The KTC seems to have had sufficient orders from overseas and from the eastern States, particularly from South Australia (interview H. Garton Smith). In 1944 a number of permit areas in the forests were put up for sale. The KTC was given to understand that if it secured one of these additional permits, the Willow Springs mill would be closed, and the intake at Nannup would not be allowed to exceed 27 000 loads (38 300 cubic metres) a year. However, the Willow Springs sawmill burnt down (Stoate 1950).

The building boom after World War II came almost as a surprise to the industry. Individual companies with the new Lower South West permits struggled to find the capital to update, build new mills, cut as much as they were allowed, and meet the extraordinary market demand. The Millars was slow to build its new Quininup mill near Manjimup; the local firm, Bunnings which had already built its Nyamup mill in 1940, was busy building the Donnelly and Tone River Mills. The KTC began work on its Northcliffe mill in 1946, but took three years to complete it because capital was required for other expansionist ventures (Mills 1986). These firms with money in new mills sought more forest resources and complained about the restrictions that had been placed on exports due to the housing demand. These were not lifted until the mid 1950s.

Robert Garton Smith relinquished control in about 1946, his son Donald becoming first State Manager, and then State General Manager in 1948. C.W. Court, later Sir Charles Court and State Premier (1974-82) became auditor for the KTC in the pre-war days. By the 1950s Court was still involved as public accountant with the KTC and was anxious to see it get a fair deal in the very competitive industry of that time (interview Court).

Western Australia like the rest of Australia was desperately short of building materials. The old established merchant families with Calvinistic values on the Boards of the timber, brick and cement companies were reluctant to spend money on expansion. They worried that the demand would ease, leaving them stranded. Court, about to enter politics, champed at the bit to see more action (interview Court), as did Gerald Wild MLA appointed to the conflicting portfolios of Minister for Housing and Minister for Forests. Throughout 1950 Wild made press statements that he was not satisfied with the efforts of the local timber firms to produce more timber (Mills 1986). The KTC seized the opportunity to lobby for a further forest permit over the Milyeaup block in the Nannup area which the Forests Department wished to keep in reserve for later (Stoate 1950). Other local timber firms, maybe suspecting that KTC was up to its old New Zealand tricks of putting its rivals out of business, discovered that Wild held meetings with Charles Court very early in June 1950. They had

Epilogue

East Asiatic made its new subsidiary a success but endured several years of substantial losses in the process. It appointed new Danish directors and managers. It rebuilt and re-equipped part of the Chatlee mill to improve operations. It opened retail 'home centres' in Adelaide and Melbourne, and it dismantled what remained of the over-extended network of business dispersed around Australia and New Zealand. In Tasmania, the sawmills at Devonport and Deloraine were sold to J. & T. Gunn; in Victoria, John Sharp's business was sold to J. Wright & Sons, quaintly echoing their founding partnership in 1853. In a final twist, Kauri Holdings Ltd was used as a shell company through which an insurance company and a finance company could obtain a 'backdoor' listing on the Stock Exchange (Reuter textline - *Australian Financial Review* 25 Aug 1987).

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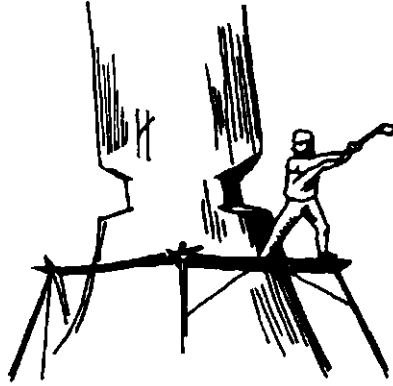
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Public History



CHAPTER 14

CHANGING NATURE OF FEDERAL-STATE* RELATIONS IN FORESTRY

L.T. Carron

The beginning of a Commonwealth role in forestry

At Federation in 1901, the new States retained, as a 'residual power', responsibility for and administration of the land and its accompanying resources such as forests. Nevertheless, within a decade, a conference of the heads of the State forest services was discussing issues which demanded 'collective consideration in the interests of the whole Commonwealth'; and, at succeeding conferences, and in evidence to the Royal Commission on the Constitution in 1927, they pointed to a role in land use and forest management they clearly saw the Commonwealth government could and should play.

In 1924, the Commonwealth appointed a Forestry Adviser and established a Forestry Bureau, which included a national professional forestry school, in Canberra. Throughout World War II (1939-45), the Commonwealth exercised complete control over the demand and supply of wood as a 'material of war' under a Controller of Timber working through Deputy Controllers in the States. The success of this cooperative federalism spilled over into an equal sense of commitment to post-war reconstruction and to long range planning on a national basis from which an Australian Forestry Council of appropriate Commonwealth and State Ministers was born in 1964.

One of the objectives/functions of this Council was:

to formulate and recommend a forestry policy for Australia directed in particular to the development of Australian forests to meet the national requirements of timber and other products, both for domestic use and export.

From this arose a plan to meet an increased proportion of Australia's demand for wood from softwood plantations and a series of loans by the Commonwealth

* Throughout this paper, 'State' should be taken to include Territory.

to the States for an expanded softwood planting program under several Softwood Forestry Agreements Acts over a period of about eleven years (1967 to 1978). Also during the 1960s the Commonwealth set up structures for better consultation and collaboration in forest-based industry matters than had existed hitherto.

The Commonwealth role expands

Emerging social and political concern for the environment

During the 1970s, forestry in Australia was to become the target of an unprecedented amount of adverse criticism and the centre of extreme socio-political dispute. At the heart of much of this was a more active and expanding involvement of the Commonwealth government in forest sector affairs; an involvement that was at once the cause and the result of the criticism.

Several circumstances coalesced. The early 1960s saw a great many small, disparate and geographically disperse groups expressing a concern at what they saw as deleterious effects by 'development' on the physical environment. The formation of the Australian Conservation Foundation (ACF) in 1965-66 as a national body offered these groups an opportunity for organisational coherence and posed a potential influence on the polls that was rapidly being recognised by all political parties. In 1967, the Commonwealth signalled a role in 'forestry', which a lot of people to that time were unaware of, by issuing the necessary licence to Harris-Daishowa for the export of woodchips to Japan from the Eden (NSW) area; and signalled how critical its constitutional role was in this regard by temporarily declaring woodchips a prohibited export under customs regulations in late 1968 until various problems in the negotiations, then taking place between various Japanese interests and various State government and private interests in Australia, could be resolved to its satisfaction. The Commonwealth government had already in 1967 signalled its approval of the expanded coniferous afforestation program by the *Softwood Forestry Agreements Act*. On the list of things worrying the 'environmental movement', woodchips and pine plantations occupied a pre-eminent place. Instead of small groups sniping away in separate States as they had been, here was now a single target against which the fire could be directed, through a national organisation for greater strength. All that was needed was a site for battle and this was fortuitously provided by the appointment in May 1970, by the Commonwealth Parliament, of a Select Committee to look at Wildlife Conservation.

During 1968-70, the Commonwealth Parliament received a great many petitions expressing concern at the extent and methods of the commercial exploitation of kangaroos. As a result, the House of Representatives directed the Select Committee to inquire into, and report on, matters around the appropriateness of

the reservation and management of Australian animals and their habitats. Since the public forests formed a large part of the wildlife habitat and were at the same time the scene for woodchips and coniferous plantations, the inquiry formed a convenient peg on which to hang objections to them and, in its report two years later, the Committee judged them to be 'the most contentious issues' in the question of wildlife conservation. This success was enough to convince the environmental movement that thence onwards most profit would come from concerted fire at the one target wherever possible viz. the Commonwealth.

The sympathetic response this might get from a Labor federal government was presaged in a speech by the then Leader of the Opposition, E.G. Whitlam, on 31 May 1971, as 'a matter of public importance' upbraiding the government for not acting on recommendations it had received and undertakings it had given to safeguard the environment; and the Opposition was able to force an amendment to the second *Softwood Forestry Agreements Bill* of May 1972 whereby the rider to the previous (1967) Act that 'the States shall ensure that the planting each year is carried out efficiently and in conformity with sound forestry and financial practices' carried an extra injunction that each State 'shall ensure that environmental factors relating to the planting have been considered'. While the State forest services regarded consideration of the environmental factors as synonymous with sound forestry practices, the extra rider held far greater intent for the Labor opposition - as it was shortly to demonstrate.

The National Estate

At this same time, an event was taking place on the other side of the world which was to become one of the most important influences on the forestry affairs of Australia. In November, 1972, the General Assembly of UNESCO, meeting in Paris, adopted a Convention Concerning the Protection of the World Cultural and Natural Heritage '... to encourage cooperation among nations to promote world-wide the heritage which is recognised as being of such outstanding value that its conservation concerns all people' obliging countries signatory to it:

to adopt general policies to establish appropriate organisations and services and to develop suitable legal, technical, scientific and financial measures for the protection, conservation and preservation of the natural and cultural heritage.

Australia agreed to the adoption of the Convention at that meeting, ratifying this agreement in 1974. The Convention came into force formally in December 1975.

The Labor Party assumed federal government in December 1972. In its electioneering, it had included in its policy an intention '... to preserve and enhance the quality of the National Estate'. To this end, it set up a Committee of

Inquiry into the National Estate in May 1973 which reported to the government in August 1974. In terms of the definitions of the National Estate adopted by it, the national forest resource formed an important component of that Estate. The Committee's views on forestry and the forest resource were critical in the extreme and gave evidence of being largely pre-determined. This unfortunately sowed a seed of mistrust and antagonism towards the national estate concept in foresters (including those already favourable towards it either by philosophy or practice) which, compounded with the manner of its subsequent administration, has until recently made 'The National Estate' by far the greatest 'bogey' in Federal-State relations in respect of the whole forest sector. The Australian Forestry Council itself expressed considerable disquiet over the report and it is possible this might have been expressed in more tangible form had the government which commissioned the report continued beyond a single term.

FORWOOD

The Council itself had for some time been aware that the pressures for wider roles for the forest resource should be accommodated but the qualitative and quantitative information about it was quite inadequate for the Federal-State planning for which it had become responsible. With State government agreement, eight Panels commenced work in 1970-71 to collect, analyse and present data on the whole range of appropriate aspects for a Forestry and Wood Based Industries Development Conference (FORWOOD) held in 1974 in Canberra. The nub of the Conference was a Production Development Plan based on an analysis of likely future supply of and demand for wood, recommending a national policy of self-sufficiency and a coniferous plantation program to that end, within constraints of conservative forest use. With State governments' approval, the Plan (and accompanying recommendations) was submitted by the Council to the Federal government which gave indications of its sympathy to the numerous proposals. Before this could take tangible form, the Labor Party was removed from office and FORWOOD was overtaken by other events. This was unfortunate at least from the viewpoint that a great many people and organisations had shifted positions, previously strongly held, to accommodate to cooperative federalism.

The export hardwood woodchip industry

In mid-1973, the Commonwealth set up an inter-departmental working group to report on the hardwood woodchip export industry which it did some eighteen months later. It was competent, professional and thorough but, to the opponents of woodchipping, it was an 'in-house' report and nothing less than a full-scale public inquiry would satisfy them. Under this pressure, that of the media and certain members of its own party, plus the need to keep faith with its pre-election expressed concern for the environment, the government promoted an

inquiry into 'The impact on the Australian environment of the current woodchip industry program' by the Senate Standing Committee on the Social Environment in November 1974. The dissolution of Parliament in November 1975 saw the matter transferred to the Senate Standing Committee on Science and the Environment in March 1976, with half the complement of membership continuous.

There were several noteworthy things about the final report which the Committee submitted to Parliament in May 1977. To that time it was the largest and most comprehensive report on any single aspect of forestry and the forest products industry arising from a public inquiry. Given the non-technical background of the Committee members and their lack of familiarity with the topic when the inquiry started, it was an outstandingly competent report and its 109 conclusions, 21 recommendations and 27 proposals were, by any objective criteria, technically sound and practicably sensible. It was an assurance that 'politicians' could handle a complex matter of this kind and do so above party politics. Above all, it demonstrated a most sensitive handling of the complex inter-relationships of Commonwealth and States that were involved. The main rationale for the Commonwealth's involvement was its authority over and responsibility for the issue of the export licences; the rest of the aspects of the matter were largely under the authority and responsibility of the States. The Committee carefully directed its 'recommendations' only to federal aspects; otherwise it 'took the liberty of advocating action within the ambit of State instrumentalities ... (and) ... grouped such advocacy ... under the heading of proposals (which it) ... hoped (would) be accepted in a spirit of constructive cooperation'. It was 'federalism' at its best. Unlike other committees on other topics, too, it followed up its recommendations a year later with an investigation into what had been done and reported on it in November 1978. It also prompted the Government to respond in terms of its own ruling, made shortly before, that the appropriate Minister report to the Parliament on the action the Government proposed to take on such a report within 6 months of its tabling. The Government's response in effect was that it was not averse in principle to new woodchip projects given appropriate environmental safeguards - not much of a return for the 137 witnesses, 245 written submissions and a first-rate job by the Committee.

The Commonwealth's environment legislation 1972-75

Four pieces of legislation enacted by the federal Labor government during its tenure 1972-75 are frequently referred to as the 'cornerstones' of its environmental policy. Three of them have been of particular importance to the forestry sector.

(1) *Environment Protection (Impact of Proposals) Act 1974*

In April 1972, by intergovernment agreement, an Australian Environment Council was set up to provide a means of consultation and coordination of action amongst the Commonwealth and State Governments on relevant environmental matters. By this time, EIA (Environmental Impact Assessment) and its attendant EIS (Environmental Impact Statement) were almost household words - certainly keywords in environment circles. After considerable study by its Standing Committee, the Council recommended legislation be set up which made the government responsible for decisions arising out of the process (not the law courts as in the USA) and the Commonwealth set about drafting legislation appropriate to the constitutional circumstances viz. the Commonwealth had a role to play but no authority or responsibility for such a role had been vested in it by the Constitution; the States held title to the major physical resources and had set up or were in the process of setting up their own environmental legislation in respect of development of those resources. A bill to establish an appropriate process, introduced into Parliament in November 1974, attracted considerable debate, but little dissent from any party (all sides by this time wishing to show their concern for the environment or their recognition of the possible electoral consequences of not doing so), and the Act had a speedy passage to December 1974.

The Act drew a neat line in acknowledging clearly the limits to which the Commonwealth could go while demonstrating its intention to push its interest and action right to those limits. It empowered examination of a wide range of activities subject to two qualifications. One, that the Commonwealth be 'involved' as for example (a) developments proposed by the Commonwealth; (b) State Government proposals wholly or partially funded by the Commonwealth (such as the softwood forestry programs); (c) State or private proposals requiring Commonwealth approval (such as a licence for the export of wood-chips). The second qualification was that the matter under consideration should affect the environment to a considerable extent - though, as the administrative procedures of June 1975 supporting the Act made clear, 'the environment' was the rather embracing term of 'all aspects of the surroundings of man, whether affecting him as an individual or in his social groupings' and in no way restricted to the physical or natural environment.

(2) *Australian Heritage Commission Act 1975*

One of the major recommendations of the Committee of Inquiry into the National Estate was the creation of an Australian Heritage Commission to operate as a statutory body under its own legislation. The federal government established such a Commission under the *Australian Heritage Commission Act 1975* which became fully operational under an *Amendment Act* in 1976. Of all

the Commonwealth involvement in the forestry sector, this was to prove the most important in many ways especially through the responsibility of the Commission to (amongst other things) '... prepare and maintain a Register of the National Estate' - effectively national estate 'places'. The Commission has no direct legal power over State or local governments, nor private property owners, in respect of places on the National Estate Register but the Commonwealth may, on the advice of the Commission, exercise the powers which arise to it from the Constitution.

(3) *National Parks and Wildlife Conservation Act 1975*

The primary purpose of this Act was 'to make provision for the establishment and management of parks and reserves ... appropriate to be established by the Commonwealth Government, having regard to its status as a national government'. Regulations under the Act, having to do with the facilitating of '... the carrying out by Australia of obligations under, or exercised by Australia of rights under, agreements between Australia and other countries', were to play a critical role in matters affecting forestry.

The Senate Standing Committee on Trade and Commerce

In 1978, the Senate became involved in debate over continuance or cessation of the *Softwood Forestry Agreements Acts* and expressed itself bewildered by the range of views on the wood supply-demand situation provided by the great many inquiries into forestry of the previous few years. While dubiously optimistic that another inquiry would provide the guidance it sought in June, the Senate directed its Standing Committee on Trade and Commerce to investigate and report on 'All aspects of Australia's forestry and forest products industries' which it did in Nov. 1981. The report was another excellent summary of the many complex aspects of the wood supply-demand situation but it was short on solutions to the problems and how to stimulate the political will to implement them.

A National Conservation Strategy

In May 1980, a World Conservation Strategy was launched under the aegis of the International Union of the Conservation of Nature and Natural Resources, the United Nations Environment Program and the World Wildlife Fund. It emphasised that development which depends on living resources can only be sustained through the integration of development and conservation and recommended that every country prepare its own National Conservation Strategy.

During the next few years, after innumerable inquiries, seminars, consultative groups, interdepartmental working groups, steering committees, public participation etc, a National Conservation Strategy for Australia was formulated. At present its role appears to be that of a 'backdrop' for the development of

policies, programs etc, of the many other aspects of the environment and its conservation which have engaged the Commonwealth's attention.

Commonwealth takes a dominant role

Tasmania

The influence of Pedder

If one were asked to nominate the starting point of the sequence of events that were to lead to the eventual political dominance on the part of the Federal government in many environmental matters hitherto thought to be internal affairs of the States and, by extension, to its political dominance over forestry, one would have to say 'Pedder'.

Not only committed 'environmentalists' but many 'ordinary' people run out of superlatives trying to describe the natural beauty of south-west Tasmania. Lake Pedder, roughly 3 kilometres square, lay roughly in the centre, feeding into the Serpentine River which flowed north west into the Gordon River thence to Macquarie Harbour on the west coast. In the early 1960s, the Tasmanian Hydro-Electric Commission (HEC) began investigations into the potential of the Gordon River for hydro-development, including building a road into the middle Gordon area with Commonwealth funds in 1964 and leading to a proposal called the Gordon River Power Development Stage One which, in effect, meant the end of Pedder as an isolated lake of almost mystic significance to bushwalkers and nature lovers generally. By August 1972, the lake had been innudated with complete loss of identity. In between times it had become an international environmental *cause celebre* as well as a national conservation versus development issue. The bitterness which the flooding of Pedder stimulated in conservation-minded people on the mainland, as well as in Tasmania, was to be at the heart of the conservation war that was there and then declared. Nor was the next battle long in coming.

The 'Dams Affair'

In October 1979, the HEC released a report on The Gordon River Power Development Stage Two recommending to the State government the damming of the Gordon River below its confluence with the Franklin River as the first stage of an integrated scheme involving neighbouring rivers in the South West. Thus began the most important environmental 'battle' to this present date that was to bring about a great many changes in Australian affairs not least in Federal-State relations in forestry. It was a three and a half year saga in which a great many people and institutions were involved; only a few 'highlights' are appropriate here.

Given the bitterness over Pedder, it was understandable that the HEC proposal would stimulate vigorous opposition to it by environmentalists on the mainland as well as in Tasmania and an alternative proposal for damming the Gordon above the Olga River, well upstream of the Franklin, posed in a referendum by the Tasmanian government in December 1981, showed the people of the State so divided on the issue that the Governor prorogued Parliament, to reduce the general political and administrative instability, until late March the following year. Its resumption saw the government lose a motion of no confidence and elections in May replaced the Labor government with a Liberal government with Robin Gray as Premier. The Labor government had in December 1980 proposed a large area, which included the lower Gordon, Franklin and Olga Rivers, for nomination to the World Heritage list which the federal Liberal-National Party Coalition government forwarded to the World Heritage Committee in November 1981 and saw it formally accepted in December 1982. Under severe pressure from the conservation movement to intervene, particularly on the grounds of the inconsistency of supporting the nomination of an area as 'wilderness' when the State government seemed determined to establish a large hydro-electric scheme in it, the Coalition refused to do so on the grounds that, whatever it as a government, or the members of it, thought of the idea, the matter of where, what and when to dam was the State's business. Nevertheless, it did support the appointment of a Senate Committee in September 1981 to inquire into and report on the whole affair (which it did in November 1982). When Premier Gray passed legislation for the Gordon-below-Franklin scheme in June 1982, the Federal (Labor) Opposition gave formal notice that, if and when it was elected to government, it would seek to stop the dam. By the end of the year, 'The Dams' was dominating national media interest and Prime Minister Fraser made a trip to the South West in January 1983, offering Premier Gray a substantial financial package to reverse the Gordon-below-Franklin legislation but it was refused.

The opportunity for the Federal Opposition came earlier than it had thought when on 3 February 1983 (the day, though not by any connected circumstances, R.J. Hawke was appointed leader of the Federal Labor Party) Prime Minister Fraser called an election for the following 5 March. Prior to entering federal politics, Hawke had at various times evinced an anti-State sentiment and to this he now added an anti-dam fervour directed unequivocally at winning electoral support from the growing number of anti-dam sympathisers in what his advisers considered to be marginal seats. In the event, Labor succeeded to national government. Whether its stance on the dams issue was critical to its success or not has been extensively debated. Given the circumstances of a secret ballot and the uncertainties of sampling polls, it is difficult to know one way or the other - as numerous analysts have indicated. What was important was that the Labor Party *thought* the support from the environmental ('Green') movement had been important and so did the environmental movement; and, from then on, the

pattern has been for the environmental movement to work hard to bring any issue of interest to it to national level and to pose electoral significance in it, whence any perception on the part of the Federal Labor Government that the issue does have electoral significance becomes influential in the government's handling of the issue.

At this stage, Federal-State relations were at their most bitter. Premier Gray had been elected to leadership of the State Liberal Party in November 1981 and elected to government in May 1982 with a pro-dam stance. Any accommodation to the new federal (Labor) government's anti-dam stance could hardly be expected and Gray painted a picture to the media of a small State being subjected to typical 'State-bashing' at the hands of the federal bully in lieu to the environmental movement and announced that work would continue on the Gordon-below-Franklin scheme, that a further hydro-scheme was being prepared and a moratorium on mining in the South West, imposed by the previous State (Labor) government, would be lifted.

Within a few weeks of the election and even before the new Parliament had met, the federal government introduced regulations, under Section 69 of the *National Parks and Wildlife Conservation Act 1975* (which had been enacted by the previous Labor federal government) as The World Heritage (Western Tasmania Wilderness) Regulations which were notified on 31 March 1983. On 6 April, it filed a writ in the High Court for the withdrawal of the HEC from the area on the grounds that the dam would cause inundation of significant Aboriginal archaeological sites and cause damage to the Wilderness Parks on the World Heritage list. The Tasmanian government responded with a writ to the High Court indicating it wished to proceed with the Gordon-below-Franklin scheme. Pending the hearing, the Federal Government passed further legislation in the matter by way of the *World Heritage Properties Conservation Act 1983* (which was assented to on 22 May, with regulations on 25 May, proclamations on 26 May, amending regulations on 27 May and amending regulations under the *National Parks and Wildlife Conservation Act* on the same day). It was clear the federal government was unsure of its position in the battle and was trying to take on board every weapon it could find.

The High Court hearing commenced on 31 May; its judgement was handed down on 1 July. As the Chief Justice was to say, the court was not concerned with the economic, social, environmental or political aspects of the matter; it was '... concerned (only) with a strictly legal question - whether the Commonwealth regulations and the Commonwealth statute are within constitutional power.' The simple answer to that question was that the appropriate sections and regulations of the 1983 World Heritage Act *were* quite valid for the purposes for which they were applied. This simple statement belies the far-reaching legal

and constitutional significance of the decisions which, as Coper (1983) described them, marked 'The Dam case as one of the most important constitutional cases to have arisen since federation'. The case was brought on to settle a long-standing political dispute between the Commonwealth and a State; its essence was development versus preservation of the environment and natural and cultural heritage; it was only to be expected, then, that the case, the decisions, the arguments for and against them and their implications, would attract an enormous amount of comment from parties interested in the legal, constitutional, political and environmental aspects and there is a substantial literature around the case. From the forestry viewpoint, its influence was enormous; the most important aspect of the judgement was the reliance of the validity of the World Heritage Act on the 'external affairs power' (Sec.51(29)) of the Constitution and it was abundantly clear this could be applied by the Commonwealth in any State forestry environmental versus developmental matter from then on - and this application was not long in coming.

Woodchips

The success of experimental work on the suitability of various Tasmanian species for pulp and paper making by the Forest Products Laboratory of the Institute of Science and Industry (later to become CSIRO), allied with the potentially cheap, abundant water and hydro-electric power, prompted the State government to grant concessions of large areas of suitable resources to interested entrepreneurs in the early 1920s. It was natural, then, that the Japanese would look to Tasmania as a likely source of hardwood fibre for their rapidly expanding pulp and paper industry in the mid-1960s. For years, the Forestry Commission had been reporting to government its concern at what it considered to be overcutting of saw logs from the economically accessible Crown estate and it saw the integrated harvesting of pulp and saw logs as providing an economic means of logging areas not economically accessible to saw log harvesting alone and the transformation of such forests to future saw log production. After considerable negotiations amongst the many interests involved, three firms were granted woodchip export licences by the Commonwealth Government, the first in December 1968.

Though 'woodchipping' had been going on for the domestic pulp and paper industry in Tasmania since the early 1930s with little public demur except for occasional criticism of the extent of the concessions and their generous royalties, the addition of the Tasmanian woodchip export operations in mid-1971 to those of the NSW south coast, which had started a few months earlier, prompted an explosive protest from the environmental movement. One reason was the almost explosive increase in the product. During the period 1969-70 to 1974-75, the annual Crown saw log cut remained roughly the same and the pulpwood cut for

the domestic pulp and paper industry only increased from 400,000 to 600,000 tonnes; the pulpwood cut for export woodchips went from nil to more than 1,000,000 tonnes. On private property, the saw log cut decreased; but the combined pulpwood for local industry and woodchip export rose from 300,000 to 1,400,000 tonnes. People were obviously concerned that, whereas pressure could be brought to bear on the Crown regarding its activities, there was no evident control mechanism in the case of private land, especially regarding the very large clearings which were a feature of the operation. The environmental movement began a concerted campaign to persuade the Commonwealth government to reconsider the export of woodchips, particularly from private land, which appeared to represent more than a third of the total resource, against the background of a State government which, as evidenced by the Pedder affair, seemed strongly committed to development with limited concern for its environmental consequences.

Tasmania was thus the focus of major interest in the Senate's investigations into 'The impact on the Australian environment of the current woodchip industry program' of 1974-77. The State Government's response was to appoint a Board of Inquiry into Private Forestry Development in Tasmania in September 1976. As a result of its recommendations:

1. A Private Forestry Council was established by 1977-78, along with a Private Forestry Division of the Forestry Commission with an Assistant Commissioner to head it, and four financial assistance schemes for reforestation of private land.
2. A *Forest Practices Act* was proclaimed in November 1987 with a Forest Practices Code for both public and private forest operations as an integral part of it. In spite of the apparent prosperity of the State in view of all this 'development', Tasmania was beset with economic problems through the 1970s and, at the recommendation of the Callaghan inquiry, set up by the Commonwealth with the State government's agreement to look into 'the structure of industry and the employment situation', the Commonwealth funded reforestation programs in 1979 and 1980.

The woodchip export licences for the three companies which had become established in the 1970s were due for reconsideration over the next few years following the accession of the Labor Party to federal power in 1983. The *Environment Protection (Impact of Proposals) Act 1974*, enabling the government to require an EIS for any proposal it was involved in which might affect the environment to a significant effect, was now very relevant; and many people were letting the Commonwealth know they considered the Tasmanian woodchip operations were affecting the environment to 'a significant extent'. The attitude of the Coalition federal government of pre-1983 was, in general, that the woodchip industry had been going for more than a decade, numerous and lengthy inquiries had shown

what was needed in respect of the environmental considerations involved, and a formal EIS was not necessary. The Labor Party had, however, committed itself to the full process if it were elected. Nevertheless, it agreed with the Tasmanian government that the time available to carry out EISs for all the companies before the dates for renewal was too short and all the licences were extended to 31 December 1988 with a single EIS for the whole of the woodchip and associated industry to be done by the Forestry Commission and the three companies as proponents under the Act. It did not help the Forestry Commission's image to be so closely associated with industry in this way but it was certainly a pragmatic solution to the problem.

After release of a draft EIS for public consideration and subsequent redrafting, the final statement was submitted in September 1985 to the Minister for Arts, Heritage and Environment who passed it on to the Minister for Primary Industry who was responsible for recommending to the government the renewal or cancellation of the licences. The former made numerous recommendations, particularly in respect of areas (places) on the Register of the National Estate which occupied a considerable proportion of the resource under consideration. On 15 December 1985, the Commonwealth agreed to renew the export licences for a further 15 years (from 31 December 1988 to which they had temporarily been extended) subject to certain conditions particularly in respect of the National Estate places. The results of the negotiations between the two governments over these conditions were embodied in a Memo of Understanding (MOU) signed on 12 June 1986. Rolley (1989), in a masterpiece of understatement, described the MOU as establishing '... a new balance in the relative powers for determining both forest land uses and forest management practices and consequently forest planning throughout Tasmania' instancing the extent of this new Commonwealth influence by a case in January 1988 when:

the Prime Minister of Australia was directly involved in the approval of timber harvesting in a specific cutting area covering 45 ha of State Forest at a place called Clumming in the Western Tiers Region of Northern Tasmania ... a process normally the responsibility of the local District Forester.

Though the MOU considerably expanded the influence of the Commonwealth over the traditional role of the State in the determination of land use, it still did not go far enough in the eyes of the environmental groups who had hoped for a participatory role in the negotiations and they began lobbying their view to the Labor federal government in the lead-up to the July 1987 election. In late 1986, they were urging the Commonwealth to intervene in the logging of two particular areas, the Lemnathyme and the Southern Forests, which was being carried out purportedly for domestic consumption only and therefore, in the view of the

Tasmanian government, not a matter for the MOU which involved only areas on which pulp was being cut for woodchips for export. The environmental movement argued that the areas were of World Heritage quality or such that logging activities on them would jeopardise the heritage values of areas adjoining them which had already been listed. The Commonwealth attempted to use the mechanism of the MOU for consultation and negotiation; the Tasmanian government rejected the attempt. When the IUCN, which advises the World Heritage Committee on such matters, was prompted to express its concern, the Commonwealth passed the *Lemonthyme and Southern Forests Commission of Inquiry Act* 1987 on 8 May 1987 which established a Commission of Inquiry, with Mr Justice Helsham as Presiding Member and two other members, requiring it to report on various matters regarding the forests and providing for the protection of them against logging pending the report of the inquiry in twelve months' time.

Throughout its term, the Helsham Inquiry (as it became known) was beset with legal challenges - as might have been expected after 'The Dams' issue. The major challenge was to the Constitutionality of the Act. Three weeks after the Commission was set up, the Commonwealth instituted proceedings in the High Court against the Forestry Commission and a company for a permanent injunction under S.17 of the Act on the grounds that they were parties to cutting down trees and building roads in defiance of S.16 of the Act. On 16 June, the Forestry Commission challenged the constitutionality of the Act thus denying its activities under S.16 were unlawful; the next day the company admitted its actions but challenged the validity of S.16 and S.17. Anticipating a delay because the matter would probably have to go to the full High Court, the Commonwealth applied for an interim injunction under S.17 which was heard on 17-20 August and granted on 3 September. The matter of the constitutionality of the Act was referred to the full High Court on 31 July who heard it 13-14 October.

The Commonwealth argued the Act was valid on the basis of S.51 (XXIX) of the Constitution - the External Affairs Power, being an implementation of the Convention for the Protection of the World Cultural and Natural Heritage, the *World Heritage Properties Conservation Act* 1983 giving effect to this Convention having been found valid by the High Court in the Dams issue. The Forestry Commission and the company argued that there were no reasonable grounds for assuming the area might be of World Heritage quality and that the prohibition of logging and roading activities in the area under consideration by the Helsham inquiry was beyond the legitimate implementation of the World Heritage Convention. The High Court brought down its decision on 10 March 1988 to the effect that the *Lemonthyme and Southern Forests Act* was valid in its entirety. It found that the external affairs power extended to the discharge of a treaty obligation 'reasonably apprehended to exist'; if Parliament considered a World

Heritage Convention obligation to exist, then the Court must endorse the action by Parliament to preserve that obligation; further, the Commonwealth had an obligation to ensure that an area under consideration of its World Heritage value not be damaged in any way while that consideration was taking place. The reaction of the Commonwealth to this was to introduce regulations pursuant to the *World Heritage Properties Conservation Act 1983* expanding the previous definition of 'identified property' to include property:

subject to an inquiry established by a law of the Commonwealth whose purposes, or one of whose purposes, is to consider whether the property forms part of the cultural heritage or natural heritage.

This had a double-barreled intention - to shut the door against any logging in the Lemonthyme and Southern Forests while the Helsham inquiry considered their World Heritage value, and to do the same in the case of the North Queensland wet tropical forests which the Commonwealth (against the wishes of the Queensland government) had nominated for World Heritage listing in December 1987, and was to be considered by the World Heritage Committee in December 1988.

The Helsham Commission submitted its report on 6 May 1988 - punctually but contentiously with a majority report from the President and one of the other two Members, and a minority report from the second Member, so differing in points of view about so many things that the majority report saw only about 30,000 hectares as possessing Heritage value, the minority report recommending the entire inquiry area plus adjoining areas totalling ten times that. Almost immediately, the Commonwealth promoted negotiations with the State on a resolution of these different findings with the continuous intervention of the environmental movement. The Commonwealth wanted to be seen to be aware of and meeting its obligations to World Heritage; the Liberal State government was anxious to surrender as little of the wood resource as possible; the environmental movement was determined to make as much capital as it could over the extent of the different 'reports'. After several 'agreements' misfired, a Heads of Agreement was eventually signed in November 1988 under which 257,000 hectares of the inquiry area would go up for World Heritage nomination; \$50 million was offered as compensation for forest resource loss and adverse industry impact, plus agreement on a range of other industry matters; and provision was made for joint government continuous review of various forestry matters including agreement that no further inquiries in Tasmania would be promoted by the Commonwealth, or areas proposed for World Heritage listing, without State concurrence. The environmental groups strenuously opposed this Heads of Agreement and pressed both governments to meet the environmental movement's long-standing aim for an enlarged Western Tasmania National Park.

In May 1989, there was a State election giving the Liberals 17, Labor 13 and the new environmental political party, the Green Independents, 5 seats. To form a government, Labor and 'The Greens' established an Accord, the support of The Greens being conditional on a number of points viz. attention to the declaration of new National Parks and World Heritage areas; a review of the status of National Estate areas in respect of logging; a ban on any increase in the export woodchip quota; and a ban on the proposed new pulp mill at Wesleydale - a matter which had figured prominently in the run-up to the election.

It was inevitable that the role and status of 'National Estate' should be a major bone of contention. By mid-1990, a little more than a third of the total forest area of the State had been listed as National Estate and, by the very nature of this categorisation, such forest was likely to be the most productive of wood. As the Heritage Commission itself has been at pains to stress, the concept of National Estate does not of itself exclude logging; nevertheless, because of the inevitable physical disturbance of logging, it would prefer National Estate areas were not logged. The environmental movement is, for the most part, totally opposed to it and has found it expedient not to disillusion those members of the public who equate 'National Estate' with 'National Park' (the exclusion of logging from which, of course, has never been in question on anyone's part). The long-running dispute over the status of the National Estate areas saw a 'crisis' in the timber industry become apparent shortly after the election with sawmills dependent on such areas running out of logs with no practical alternative sources of supply. The Greens agreed to a moratorium on that part of the Accord bearing on the National Estate and a forum was organised at which the numerous bodies most heavily involved in the issue set out to come to some sort of compromise in their respective views to meet the present problems pending later and more thorough examinations of the whole matter. The Salamanca Agreement which came out of this saw industry agreeing to support the nominations of new areas of forest to the World Heritage Register and the environmental groups agreeing to support the logging of some forests on the National Estate list to maintain the supply of hardwood logs to industry to the end of August 1990.

As a result of this agreement, negotiations began anew between the Commonwealth and Tasmania on the matter of World Heritage and, in September, an area of 1,374,000 hectares of southwest and central Tasmania was nominated, comprising the West Tasmania Wilderness National Parks area already listed in 1982 plus 600,000 hectares which, though related to the final Helsham report in some ways, bore little relation to the area the inquiry was asked to look at (indeed, apart from a few references to information gathered during the inquiry, there was little indication in the lengthy nomination of the considerable expenditure of time, money and hard work that the inquiry had involved).

Commonwealth takes a dominant role

Queensland

The wet tropical forests

Parallel with the extreme polarisation of views on Pedder, the Franklin, Lemonthyme - Southern Forests, et al, in Tasmania from the early 1960s was a similar divergence of opinions on the most desirable use of the 'rainforest' of Australia. But whereas these differences in the former case had their origin then, conflict over the role of the rainforests of Northeast Queensland was not by any means new at that time. As so many historians of that scene have pointed out in the rash of papers on the subject in recent years, conflict over land use has characterised that area since its discovery in the early 1870s. Chasing the 'red gold' further and further north along the coast from the first settlement at Sydney, the cedar-getters had begun exploiting it in the coastal rainforests near modern Cairns by the 1880s and moved to the even richer rainforests of the Atherton Tableland (to the west of Cairns) shortly afterwards. Close on their tails came the settlers, anxious to profit from the apparently fertile soils, abetted by a government with a strong philosophical and political attachment to 'opening up the lands'.

Thus there shortly arose strong arguments from the fledgling timber industry, with the support of the infant State forestry department, for the reservation of the rainforest for continuing wood production against its alienation for closer settlement. Indeed, in view of events fifty years later, it was ironic that the head of the forest service should lose his job in the early 1930s through his strongly and publicly expressed opposition to his government's policy of favouring settlement over reservation for production forestry - a policy he claimed was strongly biased toward ensuring electoral success.

By the early 1960s, the pendulum had swung again; public pressure was for reservation - but reservation for preservation, not production forestry. As Frawley (1991) puts it:

opposition to continued logging of rainforests derived from a new image of the rainforests which grew in Australia after 1960. Amid worldwide concern for nature conservation and environmental degradation, the utilitarian view of forest conservation was now challenged by an aesthetic and ecological perspective which was grounded in the advocacy of a changed environmental ethic. Given the remnant nature of the Australian rainforests, a changed image of their values, and mounting criticism of large-scale forestry activities throughout Australia, there has been a strong

call from the conservation movement for the complete preservation of the remaining rainforest.

The 'call' was certainly strong. As Just (1987) says:

Possibly no other issue in recent forestry history in Australia has captured attention and polarised opinion in the community and within the forestry profession itself as the issue of rainforests. An alliance of virtually every major conservation organisation in Australia has campaigned with unprecedented zeal to have the timber industry evicted from the rainforests, and to have the forests included on World Heritage listing.

This latter demand brought the Commonwealth Labor government into the matter on its ascension to power in 1983 and, for the next few years, there was a plethora of solicited and unsolicited reports and submissions, many of the most detailed kind, arguing for the registering of the Northeast rainforests on the World Heritage list, the only opponents to the suggestion being the Queensland Forestry Department who pointed to its long and, it considered, successful management of the forests backed by an equally long research program; the long established timber industry, especially that section of it involved in the milling of the high quality joinery and furniture woods for which the rainforests were justly famous; and the Queensland Government, anxious to retain its traditional jurisdiction over the area. The Liberal-National Coalition government of Queensland was also strongly motivated against the political philosophy and political activities of the Commonwealth Labor government, particularly in respect of the World Heritage Conservation treaty. Mercer (1991) put it thus:

Under the leadership of Malcolm Fraser, the Liberal (federal) government primarily used the convention as a means of gaining international recognition and publicity for Australia's underrated heritage resources. But since 1983 the Hawke Labor government has attempted to use the treaty in an explicitly political way to thwart some of the rather more blatant environmentally damaging activities of certain of the State and Territory administrations.

As a result of the inability of the two governments to come to an agreement over the nomination of a substantial part of the area to the World Heritage Committee during many months, the Commonwealth government announced on 5 June 1987 that it would proceed unilaterally to such a listing, following this with a formal nomination the following December. A month later, the Commonwealth brought down its *Conservation Legislation Amendment Bill*, one of the provisions of which was an amendment to the *World Heritage Properties Conservation Act* to implement a ban on logging in the Lemnathyme-Southern Forests while the Helsham Inquiry considered their World Heritage quality, at the same

time banning logging in the nominated wet tropics area while the World Heritage Committee considered that nomination. The Queensland government launched a High Court challenge to the listing and the logging ban which was rejected and the Commonwealth brought down legislation banning such a High Court challenge by a *Conservation Legislation Amendment Act* in March 1988.

Equally determined, Queensland sent a delegation to the World Heritage Bureau meeting in Paris in June 1988 to present it with an alternative case, advising the Bureau that:

the Queensland Government ... along with the majority of the people of North Queensland, all local authorities in the vicinity of the nomination, and all industry associations including the Queensland Confederation of Industry ... opposes the nomination of the wet tropical rainforests in its present form ... (on the grounds of) abuse of constitutional powers by the Commonwealth Government; inadequate consultation between the Commonwealth and Queensland Governments; inadequate scientific and technical data to support the nominations; inadequate regard for the Queensland Government's rainforest management arrangements; social and economic dislocations which would result ... (Queensland Department of Forestry 1987-88).

The World Heritage Bureau recommended to the World Heritage Committee that the area be inscribed on the list, having agreed it qualified for listing on the required counts; but suggested that the cooperation of the two governments for the subsequent management of the area was necessary as was a review of the proposed boundaries - a matter which had been the source of continuing controversy since the Commonwealth's first proposal for listing in June 1987.

The Committee met in Brasilia in December 1988 to consider the listing, the Queensland government having sent a lobby group to try to dissuade it. This was unsuccessful and the area was formally listed. The bitter conflict, however, had an important influence. The Committee decided that in future all nominations would have to be supported by a suitable management plan agreed to by the respective authorities involved and pledged as to their support. Had this rule been in force previously, the listing would not have taken place since the Queensland government had unequivocally indicated it would not cooperate in the management of the area with the Commonwealth. The ruling also meant, effectively, that the Commonwealth would no longer be able to nominate sites for World Heritage listing without the concurrence of the appropriate State(s). In the event, with changes in the political structure of the Queensland government, a cooperative management agency was established and the Commonwealth funded an industry compensation package, along with finance for management and research (Hawke 1989).

New South Wales

The rain forest

From about 1970 onwards, the NSW Forestry Commission was under a sustained attack from the environmental movement regarding its role, policies and practices. One of these attacks was directed at the logging of a group of State Forests in the far north-east corner of the State, adjacent to the Queensland border and the Lamington National Park there, about half of its roughly 50,000 hectares being rainforest communities, the other half being wet sclerophyll forest. One of the main problems in this dispute, as in subsequent disputes of a similar kind, was a lack of agreement on forestry terminology (as I have referred to elsewhere in the case of this dispute (1985) and which Baur (1987) has discussed at length in respect of NSW generally). Prompted by the problems that were arising in attempted resolution of the dispute, and in an attempt to explain and justify its policies and operational practices for the various kinds of forest in its charge, the Commission published and issued an 'Indigenous forest policy' in the mid-1970s. This stimulated rather than appeased its opponents and the government sought the advice, first of a departmental committee and then of the State Pollution Control Commission, on the future management of the Border Ranges area (as it came to be called) as a result of which it set aside part of the area as a National Park and reduced the extent of logging in the rest of it.

In early 1975, a second major focus of attention was established in an area to the south-east of the first, particularly around Terania Creek which by the late 1970s had become the centre of what had all the elements of a religious crusade and where much of the dispute became confused by differing forest terminologies. Polarised views on 'logging Terania Creek', as well as on rainforest policy as a whole, both within as well as between the Government and the Opposition, led to a judicial review in late 1979 the general finding of which was to the effect that the logging proposed by the Commission should proceed subject to certain conditions which view the government chose to ignore. By this time, the Commission had already begun phasing out hitherto routine rainforest logging and in 1982 the government decided to hasten this process and to transfer major tracts from State Forest to National Park classification. By the mid-1980s, the government was persuaded that the whole of the East Coast Temperate and Subtropical Rainforest Parks were worthy of World Heritage listing and, in contrast to the position in Queensland where the government strenuously opposed listing of the wet tropical rainforests, it proposed an application to this end through the Commonwealth government (NSW Government 1985). They were listed by the World Heritage Committee under this title in 1986.

The South-east forests

For an entanglement of State-Commonwealth Government interests and powers, and the environmental movement, in relation to forestry, nothing quite matches the saga of the South-east forests of NSW over the last twenty or so years. I have outlined at some length elsewhere (Carron 1985) the establishment of the export woodchip industry in the Eden area around 1967 and the 'conservation explosion' which this triggered. From that time onwards, this area has been the object of continuous opposition on the part of the environmental movement - at one time merely simmering at propaganda level, at another bursting with violent, confrontational activity.

The focus of interest in the south east is the Eden Native Forest Management Area (ENFMA), of roughly 300,000 hectares of which 40,000 hectares are reserved from logging for reasons of slope, rock or insufficient wood volume and 54,000 hectares are classified as Preferred Management Priority by Special Emphasis for restricted or modified logging. The area is set within a natural geographic area of about 700,000 hectares of which 50,000 hectares is managed by the NSW National Parks and Wildlife Service. The Commission's Management Plan for ENFMA was published in 1982, for revision in 10 years. The logging plan and prescriptions were met at the time with a strong challenge by the environmental movement on numerous 'environmental grounds'.

The tempers of the environmental movement were particularly aroused in 1985 when Harris Daishowa (the woodchip industry operator) applied for renewal of its export licence. The environmental impact statement which it was asked to present with its application stimulated numerous submissions by the movement to the Commonwealth government advocating logging be disallowed in several 'significant' areas. Four of these were inspected by the Australian Heritage Commission and the Forestry Commission jointly and it was agreed two of them should be considered for National Estate listing; consideration of the other two areas, Coolangubra and Tantawangalo, which were to figure largely in the saga from there on, being temporarily deferred (the former being listed eventually in 1989). In March 1987, the Senate Standing Committee on Science and the Environment, which had conducted the intensive inquiry into the woodchip industry some years earlier, visited the area (as it had done periodically since submitting its report to Parliament) and expressed itself satisfied with the industry's response to the recommendations of its report.

Nevertheless, in apparent response to the continuous pressure of the environmental movement, around the question of logging forests listed on the National Estate, that was being applied in anticipation of Federal elections in July 1987, the Commonwealth continued to dally over the renewal of the licence. More than two years later, the Commonwealth still had not moved one way or the other. Pressure on the State Labor government saw it move during this period to

make a considerable part of the area a national park, a motion that was reviewed with the accession of a Liberal-Country Party government to power. Continuous frustration over their uncertainty in the future of the industry saw a large rally of logging contractors at Parliament House, Canberra, on 1 June 1989. Whether this, and subsequent discussions between industry representatives, the Prime Minister, and appropriate other Commonwealth Ministers was influential or not, agreement was reached in mid-July on proposals aimed at settling the conflict over logging in the south east forests. The main proposals were:

1. logging in most of the National Estate areas of these forests be deferred until the end of the year and NSW agree to cooperate in exploring all prudent and feasible alternatives to further logging in the National Estate areas before July 1990; and
2. a joint Commonwealth-NSW Scientific Committee be set up to undertake biological studies in the Eden area.

By early 1990, it was agreed that, pending the Committee's report, logging could continue in about 5 per cent of the National Estate area because there were no prudent or feasible alternatives to this to ensure committed supply; and the woodchip export licence would be renewed to the end of 1990. In anticipation of the Scientific Committee's report and aware of the need to develop an industry strategy for the area from it, the Commonwealth proposed the establishment of a Regional Consultative Committee of industry, government and conservation representatives. Initially on a Commonwealth-NSW basis only, it shortly became clear that there were advantages in a representation that included East Gippsland, particularly as the Commonwealth was pushing for better utilisation through a flitchmill, for 'value adding' processing in the area, the development of hardwood plantations to assist in phasing out native forest logging (particularly of 'old growth') and increasing pulpwood recovery; and, in all these matters, it made more sense to consider the contiguous forest areas of Victoria along with the south-east forests of NSW. The conservation groups insisted, unsuccessfully, on a moratorium of logging as conditional on their participation.

The Scientific Committee submitted a most comprehensive report in July 1990, to the Commonwealth and NSW governments jointly (Joint Scientific Committee 1990), with particular recommendations in respect of an expanded reserve system; and multiple use forestry incorporating wood production within the National Estate forest areas, but outside the reserves, under certain conditions. NSW and the Commonwealth reached an agreement about the establishment of new reserves but their gazettal was temporarily deferred pending the introduction of Commonwealth legislation on the matter of 'resource security' which was being strongly pressed on government by industry at the time.

On 7 September industry began to stage a rally of people and vehicles from NSW and Victoria at Parliament House which was to escalate over a week, with numerous proposals for government action and numerous Commonwealth and NSW Ministerial meetings. Federal Cabinet agreed to the logging of a further 15 compartments in National Estate areas and accepted the NSW government's proposal that additional reserves would be established when the complex matter of 'resource security' in relation to the 'powers' of the Australian Heritage Commission had been resolved. This was a continual thorn in industry's side. The conservation movement argued that a simple Agreement or Memorandum of Understanding between governments should be a sufficient guarantee of 'resource security' to industry for investment purposes; industry pointed to the failure of these mechanisms in loose form in Tasmania and Victoria, and the need for tight legislation to support them. By early October, agreement had been reached on a new reservation system the formal dedication of which would not take place until 1991 and the finalisation of a package of 'industry restructuring and compensation'. Industry saw itself reasonably happy with this proposal; the ACF saw it as 'a national crisis'.

On the last day of February 1991, the South East Forests Regional Consultative Committee which, by way of four working groups, had been meeting for the past half-year to develop a strategy for the forest based industries of the South-east NSW and East Gippsland forest resource, presented a draft of the proposed strategy to the Commonwealth, NSW and Victorian governments. The Committee considered 'the main issues had been thoroughly covered and the recommendations ... accurately targeted and comprehensive'. It was clear, however, that the key issue in it all was 'resource security'. At this stage, industry was not prepared to promote the necessary investment without the certainty that the resource on which it was predicated could not suddenly be whipped away by the Australian Heritage Commission; and the Commonwealth saw considerable political difficulty in altering the legislation on which the Commission was mandated, both in concept and practice.

Industry might well have been pardoned for seeking an unequivocal relationship with the Commonwealth government at this stage, given the actual and potential influence that government had developed. In May 1991, NAFI (1991) was able to list no less than twenty major Commonwealth inspired or directed inquiries, working groups, treaty negotiations etc. likely to affect the future of the forest industry'. The final report of the Committee went to the three governments in September. Nothing in it was likely to move pending the Commonwealth's consideration of resource security. A draft bill on this vexed matter was circulated in October; it was introduced into the House of Representatives as the *Forest Conservation and Development Bill* 1991 at the end of November. The legislation passed the House of Representatives on 2 March but without amendments which industry and the Coalition Opposition thought essential. A prolonged

Senate debate saw it referred to the Senate Committee on Rural and Regional Affairs to little avail; it was voted down by the Senate on 5 May 1992.

Western Australia

It will be clear from what has been said in relation to the other States, the concept and the application of National Estate, as it is presently constituted, has been at the forefront of problems in forestry in Australia. To the rational viewer, much of the problem associated with National Estate might be at least mitigated, if not wholly overcome, if a system could be developed whereby the Australian Heritage Commission itself, and the trustees of a particular public estate such as a State forest service, would jointly study an area (say, of the order of a region), agree on what might reasonably be considered as appropriate for National Estate listing, draw up agreed forest management plans for the region (including those listed areas) with mutual approval and then have the forest service implement them on the understanding that there would be no changing the list except by mutual agreement or under some extreme circumstance - subject, of course, to some periodic reviews. This 'system' is in essence what the Western Australian Government (through CALM, its Department of Conservation and Land Management) and the Australian Heritage Commission announced as having been agreed to in January-February 1992.

After some years of conflict between the Western Australian Government and the Commonwealth Government, through the Heritage Commission, over National Estate listings and their significance in that State, the Commission met in Western Australia in September 1990 and held discussions with CALM which resulted in a public announcement that the two would combine to resolve outstanding issues in the Southern Forest Region. A general conceptual framework for this, which had been under development for some time, was being proposed by the Commission in its submission on the National Estate to the Resource Assessment Commission Inquiry in October. An agreement in the form of a Memorandum of Understanding (MOU) between the two governments outlined the basis for joint study of the Southern Forests and future similar ones. A considerable amount of the whole 'story' was provided in an 'Information Kit' put out by the AHC. The MOU was extensively promoted by the two governments as 'providing a model for dispute resolution on similar matters in other States' which, in principle, seems unarguable but there is little evidence at present of the other States following suit (though there are some obvious reasons for this). More arguable was the claim by the Commonwealth minister that, as a result of the MOU, '... the timber industry will be secure'. Industry's reaction was understandably that, from its past experience, MOU's without legislation to back them provided doubtful 'resource security'. The study which followed was reported by the AHC and CALM jointly in February 1992.

Initiatives, issues and interactions

From early 1987, apparently stimulated by the perceived electoral importance of 'the environment' and with a federal election shortly due, the Commonwealth began, and has since continued, to promote numerous what I have called here 'initiatives, issues and interactions (with the States)', many of them involving forestry, in an almost bewildering stream. It is inappropriate to discuss these at length here, though many became major matters in their own right. Many eventually overlapped, and many were conceived as inter-related, interconnected or integrated, so that it is difficult to discuss them in isolation and to order them chronologically. What follows is a necessarily abbreviated treatment, mainly for record purposes, listed in no particular order.

Ecologically sustainable development (ESD)

'Ecologically sustainable development' (ESD) came in for frequent reference in environmental matters in the 1960s, in simple terms being '... development that improves the quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends' (Australia 1992). The concept was developed as an agenda item at the U N Conference in Stockholm in 1972. It was first given formal international coherence with the publication of a *World Conservation Strategy in Living Resource Conservation for Sustainable Development* jointly by IUCN, UNEP, and WWF in 1980 and received international acceptance in *Our Common Future* (the Bruntland Report) by WCED in 1987.

The Commonwealth began promoting it for Australia in the Prime Ministerial Statement on the Environment *Our Country, Our Future* of July 1989. Following a meeting of government representatives and wide representations of private and public sector organisations, a paper was released for public comment in June 1990. The government subsequently appointed nine Working Groups, one responsible for Forest Use, to consider how the principles, by this time fairly well agreed on, could best be implemented in those areas of the economy having significant interrelationships with the environment. The Forest Use group presented its report to the government and public in December 1991. This was followed by a full Draft National Strategy on the matter in June 1992. This is to be followed in September, after public and governmental comment, by a proposed strategy for Heads of Government consideration; the principles providing the framework for the development of this strategy, and the National Greenhouse Strategy with which it is linked, having been previously endorsed by the Heads of Government in the Intergovernmental Agreement on the Environment.

Resource Assessment Commission

The environment became a particularly pressing trend in the Commonwealth political process during 1988, Ministers involved with it in any way seeking to

find politically convenient (and thus often somewhat contradictory) solutions to the problems inherent in 'conservation and resource development', both urban and rural. In November, the Prime Minister announced a number of major changes in the government's approach (Australia 1988). The basis of this new approach was formed by 'three policy principles to be publicly promoted' and used as a guide to Commonwealth Ministers in resolving conflicting land use claims viz:

1. There should be an integrated approach to conservation and development by taking both conservation and development aspects into account at an early stage;
2. resource use decisions should seek to optimise the net benefits to the community from the nation's resources, having regard to efficiency of resource use, environmental consideration and an equitable distribution of the return on resources; and
3. Commonwealth decisions, policies and management regimes may provide for additional uses that are compatible with the primary purpose values of the area, recognising that in some cases both conservation and development interests can be accommodated concurrently or sequentially, and, in other cases, choices must be made between alternative uses or combinations of uses'.

Along with these new principles, several new processes were announced viz.

1. the establishment of a Resource Assessment Commission, an independent body to inquire into major, complex, land use decisions;
2. streamlining and enhancing the operations of the Australian Heritage Commission;
3. the negotiation of a Forest Accord; and
4. the development of a National Forests Inventory.

In November 1989, the Prime Minister announced that the Resource Assessment Commission (RAC) would conduct an inquiry into 'options for the use of Australia's forest and timber resources', the scope of the inquiry being 'to identify and evaluate options for the use of those resources'; and report by 30 November 1991. In the event, the Commission submitted a draft report in July 1991 for public comment and a final report to the Prime Minister in March 1992 (RAC, 1992). The inquiry was far-reaching and the report comprehensive, an enormous amount of information and views on the forest resource, and a range of aspects to do with it, being gathered through the evidence from governments, reports by consultants and submissions from groups and individuals. There seemed general agreement amongst the governments involved (as of August

1992) that the best way of dealing with the Commission's views and recommendations was to incorporate them into the national forest policy being prepared at that time.

Forest Accord

The then new Commonwealth Minister for Resources (Senator Cook) took the opportunity of an address to the National Association of Forest Industries in April 1988 to suggest a Forest Accord (or 'forest compact') between governments, industry, union and conservation groups, and initial discussions were held in October. Senator Cook announced in November that Cabinet had authorised him to commence formal negotiations on such an Accord with discussions focussing on resource security, safeguarding environmental values, value added processing, promotion of more plantations, and the like. A meeting planned for November was cancelled when conservation representatives refused to involve themselves as a result of the Heads of Agreement signed by the Commonwealth and Tasmania governments a few days earlier. The renewal of woodchip licences in Western Australia and New South Wales shortly afterwards further strengthened the conservation movement's resolve not to be a party to any 'accord'. Twelve months later, the Minister was still appealing for an Accord to consider the wide range of matters bedevilling forestry without any positive response from the conservation movement; and his unsuccessful efforts to find 'accord' over matters involved in individual issues, such as that of the south-east forests of NSW at the time, seemed to put paid to the whole idea.

National forest inventory

It was very clear to anyone involved in the disputes over forest use that began to proliferate in the 1980s amongst the Commonwealth and State governments, industry and the great range of people pushing conservation arguments of various kinds and at various levels, and just as clear to the interested onlooker, that much of the energy of the disputes was often dissipated by the lack of factual information on the matter or personal interpretation that was difficult to challenge. As the Commonwealth became more and more the critical protagonist or leading arbiter in forest and forestry issues, it argued that it could only make effective decisions if it had the sort of information the States had accumulated as part of their stewardship of the resource. Whilst the States could see reason in this view, they saw holding this information as some source of power in what was rapidly becoming a power game and saw little point in providing information to the Commonwealth that might (and increasingly became clear more than likely would) only put the States at a disadvantage.

The eventual effectiveness of the National Forest Inventory (NFI) hinges on the rate and extent of resolution of this situation. The cooperation of the States in providing information has been established through a Memo of Understanding.

Representatives of the States and Commonwealth form a National Steering Committee which oversees the program of data collection, analysis and storage which is under the joint management of the Department of Primary Industries and Energy, and the Department of Arts, Sport, the Environment, Tourism and Territories, with operational responsibility in the Bureau of Rural Resources. Data storage, and processing expertise and facilities are provided by the National Resources Information Centre (NRIC) which was already functioning prior to the establishment of the Inventory; and the latter interacts with the Environment Resource Information Network (ERIN) which was commissioned contemporaneously with it (1989-90), and with the Australian Surveying and Land Information Group (AUSLIG). While the functions of the NFI are quoted as including 'identifying and describing forest communities and their current conservation status; and providing the basic wood production information for planning efficient and sustainable forest utilisation', so far the emphasis has been on the former.

National wilderness inventory

National Wilderness Inventory was initiated in 1986. Most States and Territories had been covered by 1992.

Biological diversity

The concept of Biological Diversity (biodiversity) i.e. the variety of all life forms (plants, animals and micro-organisms, their genes and their ecosystems) is basic to the science of biology. With the increasing concern of the last few decades for the environment, the idea of some sort of international treaty or convention in respect of this concept has gained more and more momentum and was adopted for consideration at the Earth Summit (Rio de Janeiro, 3-4 June, 1992). Over this time, the thrust of the concept has shifted a little from preserving wild areas showing exceptional biological diversity to the sustainable development of biological resources generally and to its inclusion in the general concept of ecologically sustainable development - all of which has led to some confusion in its interpretation and acceptance.

The Prime Minister's Statement on the Environment of July 1989 presaged a national strategy on the matter with various elements drawn from other Commonwealth programs, such as the Save the Bush remnant program, the National Index of Ecosystems, the Environmental Resources Information Network and the Endangered Species Program. A draft 'National Strategy for the Conservation of Australia's Biological Diversity' was released for public comment at the Fenner Environment Conference (Canberra, 11-13 March, 1992). Trenchant comments from various parties, included in a vigorous and extensive public response to the draft, delayed its intended presentation to the Earth Summit although the International Convention there was signed on behalf of Australia. A final strategy was expected by mid-September.

National tree programs

If, as I have described earlier, the situation as regards initiatives, issues and interactions on the part of the Commonwealth in respect of forestry is somewhat bewildering, the situation as regards trees in various forms is bewildering in the extreme. It is referred to here only in a brief, and thus possibly in a distorted way, but it is important in that it cannot be separated from 'forestry' in its contribution, and it represents considerable funding.

Thus, 1982 was declared the Year of the Tree; a National Tree Program was established, administered by Greening Australia, 'to promote action at individual, community and government levels to conserve, regenerate and plant trees'. In 1989, two additional programs were established, (i) a One Billion Trees program involving a Community Tree Planting Program to plant 400 million trees and a Natural Regeneration and Direct Seeding Program to establish 600 million trees; and (ii) the conservation of remnant native vegetation in a Save the Bush program.

In 1983, a National Soil Conservation Program was established to provide national leadership and funds toward reducing soil degradation. Government cooperation was established by the formation of an Australian Soil Conservation Council of Ministers; and cooperation beyond governments established in 1989 by a Ministerial Task Force that included representatives of the National Farmers and the Australian Conservation Foundation. As a guide to policy, a National Soil Conservation Strategy was also launched that year. The Commonwealth's contribution to this strategy was Landcare - the Year 1990 and the Decade (1990-2000), with extensive funding for numerous elements and programs.

In 1987-88, the Commonwealth set up a National Afforestation Program of funding to assist governments and the private sector establish hardwood plantations and afforestation demonstration areas, and to carry out appropriate research. Part of its aim was to reduce eventual industry reliance on the native forest. Since then, the funds have been used variously, e.g. for the National Plantations Advisory Committee in 1990-91, and for the National Forest Policy in 1991-92. These programs (and their sub-programs) interrelate in various ways in respect of administration and funding as helpfully illustrated by Boutland *et al.* (1992).

Endangered species

In 1988, the Commonwealth established an Endangered Species Advisory Committee of representatives of government and public conservation agencies, scientific institutions and the farming community which released a draft 'National Strategy for the Conservation of Species and Habitats Threatened with Extinction', for public comment in December 1989. Also, in 1989, the

government committed itself to a ten year Program to include developing an Australia-wide data base of endangered species, their habitats, and their status within and outside reserves. In March 1990, consideration was given to the enactment of appropriate legislation in respect of matters that, by Commonwealth-State agreement, lie clearly within the Commonwealth's ambit and a proposed legislation was released for public comment in January 1992 (ANPWS 1992). While the intention of the legislation seemed acceptable to most people, industry, for example, expressed considerable concern that, linked to an international treaty, it would enable the Commonwealth to use its external affairs powers to enforce the legislation throughout the country without any restriction.

Commonwealth Environment Protection Agency

In March 1990, the Prime Minister announced the government intended to establish an Environment Protection Agency (EPA) 'to improve the Commonwealth's capacity to confront environmental issues and find long-term solutions'. In July 1991, a position paper for the proposed agency was released for public comment. An 'overview' of the more than one hundred submissions, released in early 1992, showed the inevitable range of views from those who saw no role at all for what they considered would be merely another bureaucratic layer over an already overloaded system, duplicating roles and functions already carried out by or at least the responsibility of the States; to those who saw the Commonwealth as now so involved with 'the environment' that such an agency was mandatory.

In the event, a Commonwealth Environment Protection Agency (CEPA) was established within DASET, becoming functional in February 1992, '...to work with all levels of government, business and the community to help establish a consistent coordinated approach to environmental protection'. It will coordinate with the National Environmental Protection Authority (NEPA), a Ministerial Council of Commonwealth and State Ministers responsible for environmental quality standards and measures for environment protection, established in May 1992 under the Intergovernmental Agreement on the Environment.

Plantations Advisory Committee

Among the reports which the Commonwealth commissioned toward the eventual formulation of a national forests policy was that of a National Plantations Advisory Committee which it established in December 1990 with various terms of reference, mainly to:

provide advice to the Government on strategies to foster the development of Australia's plantation resource base on cleared agricultural land ... through private investment where

commercially viable, with emphasis to be given to development of hardwood plantation resources but also with consideration of alternative enterprises, including softwood plantations (NPAC 1991).

The Committee drew its membership of seventeen from the State forest services, universities, CSIRO, industry, the conservation movement, the Institute of Foresters, the National Farmers Federation, local government and growers. It submitted a substantial report on 'Integrating forestry and farming' in November 1991.

Intergovernmental agreement on the environment

The Prime Minister's One Nation Economic Statement of 26 February 1992, announced that the Commonwealth and States had settled the text of the Intergovernmental Agreement on the Environment which had been under discussion for some time, delineating the respective responsibilities and interests of the three spheres of government. With its nine schedules viz.: environmental data, land use decisions and approval processes, environmental impact assessment, environment protection, climate change, biological diversity, national estate, world heritage and nature conservation, practically every 'issue' is covered.

National Forest Policy

It may be thought strange, puzzling or ironic, that nearly 30 years after the establishment of the Australian Forestry Council of Commonwealth and State Ministers of Forestry (or appropriate portfolio), one of whose major objectives was 'to formulate and recommend a forestry policy for Australia', that Australia still has no national forest policy, in any real sense of the term, at all. The early meetings of the Council saw governments agree to a policy of self-sufficiency in wood and saw this implemented, as a first step, in the *Softwood Forestry Agreement Acts*. By 1980, a rider had been attached - Council thought:

forest policy throughout Australia should be directed towards ensuring that Australia had a long term capability to supply such of its own requirements of forest products as might be consistent with economic and environmental considerations.

Understandably, from then on, the whole position of forestry within the wide ranging matters of 'the environment', and the increasing involvement of the Commonwealth in them, complicated any simple policy being formed and formulated that was in any way a satisfactory basis for action for all the States and the Commonwealth and the vague prescriptions implied in 'consistent with economic and environmental considerations' left plenty of room for manoeuvre. Nevertheless, the arguments on which the establishment of the Council was

based had not changed - if anything, they had intensified; and the guidance of a policy through what had become a minefield of complications to do with the environment, and Commonwealth-State interactions in respect of it, had become even more urgent as witness the continual promises of such a policy from the Chairman of the Council in recent years and the continuing appointment of Commissions, Committees and Inquiries to provide the 'final' answers to the problem.

In December 1992, a 'National Forest Policy Statement' was released, signed by the Heads of Government of the Commonwealth, States and Territories (with the exception of Tasmania which 'affirmed its commitment to the management of its forest resources as set out in the Tasmanian Forests and Forest Industry Strategy') committing them '... to implement, as a matter of priority, the policies in it for the benefit of present and future generations of Australians'. It purports to be their 'joint response to three major reports on forest issues ... the Ecologically Sustainable Working Group on Forest Use, the National Plantations Advisory Committee and the Resource Assessment Commission's Forest and Timber Inquiry ... (building on) the 1983 National Conservation Strategy ... and the 1986 National Forest Strategy'.

One can only regard it as a very limited 'response' indeed. As a statement of principles around the whole matter of forest use and forest management in this country, it is exemplary; I doubt there is a sentiment in it to which the most ardent 'conservationist' or the most rabid 'developer' could reasonably take exception. But its 'goals', its 'specific objectives', are essentially *qualitative*, it lacks anything by way of immediate or future *quantitative* wood production goals - whether, for example, we should give up growing wood altogether, or continue to meet something like our present commitment (which is less than our present needs), or aim to meet not only our own needs but grow a surplus for export as well. It is the practical application of these fine-sounding principles to the matter of wood production that is the basis of the contentions about forest use and forest management in Australia today. To this prime matter, the 'policy' fails to address itself in any way.

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CHAPTER 15

REGIONAL ASSESSMENT OF THE HERITAGE VALUES OF FORESTS

Rosemary Purdie and Mike Cavanagh

Introduction

In Australia there is widespread acceptance of the need to identify and protect places of heritage value. The Australian Heritage Commission was set up in 1976 with a specific function to identify Australia's National Estate, 'those places, being components of the natural environment of Australia or the cultural environment of Australia, that have aesthetic, historic, scientific or social significance or other special value for future generations as well as the present community' (*Australian Heritage Commission Act, 1975*) and develop a register of these places: the Register of the National Estate. The Commission's other major role is to provide advice concerning the nature and protection of national estate values. Under the *Australian Heritage Commission Act 1975*, only Commonwealth Ministers and agencies are required to seek advice from the Commission in matters concerning the National Estate. Examples of where such advice is required to be sought are for the issuing of export licences and for major foreign investment proposals. The Commission is also able to provide specific and general advice on national estate matters when invited.

Since the Commission's inception, forests have figured prominently in its work, through both listing forest areas in the Register of the National Estate ('the Register') and providing advice on their protection. Woodchip export from native forests has been a major industry in Western Australia, Tasmania and New South Wales since the early 1970s. The use of timber for woodchips, and the increased intensity of forest harvesting associated with the woodchip industry in eastern Australia sparked widespread community debate, particularly over old growth forests, which are a prime source of timber and have high conservation values. The forest debate has largely revolved around issues such as sustainable uses of forest resources, the adequacy of nature conservation reserves, value-adding in the industry, and the appropriateness of various logging practices in sustaining environmental values.

Both environmental and industry groups have campaigned vigorously over the use of Australia's forests. Because of Commonwealth obligations under the *Australian Heritage Commission Act* to protect the National Estate, forests listed in the Register have often been the focus of disputes between industry, conservationists and State Governments. In New South Wales, Tasmania and Victoria, such disputes have resulted in special negotiations between relevant Commonwealth and State Government Ministers to resolve these issues.

Factors leading to the development of a regional assessment model

Since 1976, over 10,000 places in the natural and cultural environments have been listed in the Register (Australian Heritage Commission 1991). However, despite its current size, the Register is by no means comprehensive. Since its inception, the Commission has had a policy of accepting, and actively encouraging, public nominations of places to be assessed for placement on the Register. The large majority of registered places have thus been entered as a result of an ad hoc process. The continuing process of compiling this inventory means that places are frequently listed after planning or land use decisions, such as the issuing of woodchip export licences, have been made. For forest areas, this has been a major cause of uncertainty by industry about the security of access to timber resources in listed areas.

Places are entered in the Register if they meet the threshold for significance against one or more of the national estate criteria (see Appendix 1). In making decisions about whether to list places in the Register, the Commission is required, under its enabling legislation (*Australian Heritage Commission Act 1975*), to give 'upmost consideration to the significance, as part of the national estate, of the place'. Decisions on whether places meet these criteria thus do not take into account factors such as economic value, land tenure, land use or planning decisions. This decision-making basis is essential if the Register is to be a comprehensive list of all places meeting the threshold of significance, to act as an alerting device to planners and decision-makers at all levels of government so that the national estate values may be taken into account during decisions affecting the places.

A consequence of identifying areas solely on the basis of their national estate values is that boundaries delineating areas for listing in the Register frequently differ from boundaries based on land use and planning considerations. Where the purpose of the Register and the basis for making decisions about listing are misunderstood, listing is frequently interpreted as ignoring legitimate land use planning decisions and is thus a source of discontent. In reality, listing and land use decisions are two entirely separate processes.

Where action groups or individuals are not satisfied with State Government planning processes or decisions on Crown forests, listing in the Register has been used as the focus of campaigns to overturn or modify planning decisions. Campaigns opposing logging in national estate forests have resulted in a high level of conflict within the community in New South Wales, Victoria, Tasmania and Western Australia over the last decade. In the above campaigns, listing is frequently seen to be the cause of conflict, although the conflict would generally occur irrespective of whether a place was listed in the Register or not. The strength of campaigns aimed at halting activities in some listed forest areas has created a widespread and undifferentiated community perception that listed places are, or should be, treated like conservation reserves by State Government authorities and that the Commonwealth Government and/or the Commission should enforce this. However, listing places no legal constraints on state or local governments or on private owners; there is no obligation to change their management or land use as a result of listing. The only obligation resulting from listing a place in the Register occurs at the Commonwealth level. The Commonwealth government is required, under section 30 of the *Australian Heritage Commission Act 1975*, to protect listed places to the extent possible if there are no feasible and prudent alternatives to actions which adversely affect places. Where significant impacts might result, Commonwealth Ministers, departments and authorities are required to seek advice from the Commission, so that heritage aspects are considered together with economic, social and other aspects by the Commonwealth decision-maker. The Commission's role in the Commonwealth decision-making process is purely advisory; it has no power of veto over proposed development activities. Section 30 advice is generally sought by Commonwealth decision-makers for major development proposals such as export licences, development of pulp mills etc. The referral to the Commission for advice usually comes at the end of detailed environmental assessment and planning at the Commonwealth and State Government levels. Advice provided by the Commission on the impacts of proposals on national estate values and on measures to minimise such impacts is thus often perceived to be interference with planning which has already taken place.

For major development projects there is often no doubt that the proposal will have adverse impacts on the national estate values of listed places, although there is often considerable debate about the nature and intensity of impact, and thus on appropriate mitigation measures. For many proposals on which the Commission is required to provide section 30 advice, the Commission is only able to provide comments which focus on the individual place in isolation. This is best illustrated by referrals under the Memorandum of Understanding between the Commonwealth and Tasmanian governments, where the Commission is required to provide advice on activities such as logging in individual coupes. In this situation it is difficult to provide protection advice because few alternatives can be considered and the means of minimising adverse impacts are generally very restricted.

The above problems have been exacerbated by the generally ad hoc way in which forest areas were nominated to the Register during the 1970s and 1980s. Together with a lack of detailed knowledge about forest areas (listed or not), this has hampered the Commission's ability to provide effective advice on the protection of national estate forests, and the ability of State Government managers to carry out activities planned under State legislation in crown forests listed in the Register.

Adoption of regional assessment model in Commonwealth initiatives

The continuing high level of conflict over forest areas in the late 1980s resulted in the Australian Forest and Timber Resources inquiry by the Resource Assessment Commission (RAC) in 1990-91, the setting up of an ESD Working Group on Forest Use in 1990, and a concerted push by the forest industry in 1991-92 for Commonwealth legislation to guarantee security of access to timber in native forests. National Estate issues figured prominently in each initiative.

In its submission to the RAC forest inquiry in October 1990 (Australian Heritage Commission 1990), the Heritage Commission proposed a methodology for helping to resolve national estate forest issues. The methodology focussed on systematic survey to identify areas of national estate significance coupled with appropriate management to protect identified values, using a regional framework as the basis for decision-making. A detailed regional assessment model was developed in 1991-92 by the Commission, in co-operation with the Western Australian Department of Conservation and Land Management (CALM), from work in the Southern Forest Region of south-west Western Australia. Full details of the model are provided in the five volume published report of the work (Australian Heritage Commission and the Department of Conservation and Land Management 1992). Although still in its early development, the model gained cautious acceptance by Resource Assessment Commission (1992) and the ESD Forest Use Working Group (1991).

The need for an appropriate model was highlighted during the development of the Commonwealth Government's proposed resource security legislation, the *Forest Conservation and Development Bill*. In order to provide security of access to industries, the Bill proposed a once-off integrated assessment of forests for development proposals exceeding \$100 million. The integrated assessment was designed to ensure that all Commonwealth environmental obligations, including those relating to the National Estate, would be met during a single integrated assessment process. Where environmental and heritage requirements were satisfied following the integrated assessment process, approval would be granted for the life the project, with no further revisiting of environmental matters unless there were exceptional circumstances. Section 30 obligations under the *Australian Heritage Commission Act* would be discharged for the life of the project through a single referral as part of the up-front integrated

assessment. It was therefore essential that all national values in any project area be identified in a comprehensive way during the integrated assessment to allow the most focussed advice on the protection of national values in the region affected.

Recognising that the Commission's regional assessment model was a significant component of the Commonwealth's proposed integrated assessment, the Prime Minister committed additional resources to allow an expanded program of national estate regional assessment in co-operation with the States (Prime Minister 1992). The integrated assessment is a key part of the National Forest Strategy (Commonwealth of Australia 1992) approved by Federal Cabinet in November 1992 with the Heritage Commission being given a central role in collecting data for the Commonwealth's environmental requirements. At the time of writing, all the States, with the exception of Tasmania, have signed the Agreement.

AHC-CALM project in Western Australia

The work involved the systematic assessment of national estate values in the Southern Forest Region of Western Australia and the development of strategies for their protection is described in this section. The Southern Forest Region, an administrative region used for management purposes by CALM, was chosen for the study because the Commission had received a large number of forest nominations for the Register in the Region, and a Commonwealth decision was required annually for woodchip export licences, thus requiring annual section 30 referrals to the Commission. CALM also had a computerised database for the Region containing a wide array of information relevant to national estate criteria. Work on the project commenced in late in 1990 and took over 12 months to complete. All stages of the project were carried out cooperatively between the Commission and CALM, using all relevant data available from CALM and other scientific experts who had worked in the Region.

Assessment of national estate values

The Commission's criteria for significance (see Appendix 1) were used as the basis for analysis of national estate significance. These criteria allow the identification of places which:

- are either exceptional in, or characteristic of the Australian natural or cultural environments;
- are of symbolic or social value to the Australian people or to particular regional, ethnic or other communities;
- characterise the periods and processes in the evolution of Australia's natural and cultural environments; and which

- are important in the context of those arts and sciences related to the natural and cultural environments.

The first stage was the identification of all attributes in the region relevant to the assessment criteria (see Appendix 2). Although the Southern Forest Region boundary is an administrative one, it encompasses the 'karri belt' - the main occurrence of karri forest (*Eucalyptus diversicolor*) - and forms a reasonable approximation of the ecological region within which this important community type is found. Approximately 130 relevant attributes were identified in this region. An assessment was then made of the level of knowledge about each attribute throughout the region. Because of inadequate data or a lack of data availability across the region, it was decided that cultural values would not be included. Although focussing on the region's forests, it was decided to include non-forest communities in the study, and both biological and physical values of the natural environment.

Once the types of attributes for which sufficient data were available throughout the Region had been determined, the following steps were then carried out for each type of attribute:

- analysis of the characteristic features, distribution and condition of the type throughout the region;
- separate analysis of the type against the relevant assessment criteria to determine the environmental value(s) associated with the type. For example, karri forest communities were assessed specifically or in combination with other communities against criteria for rarity, diversity, as characteristic of their type, importance for research, and for the conservation of biotic processes;
- for each relevant criterion, determination of a threshold level of significance for the type (i.e. the level of significance above which all places containing the type are considered to be significant for the value described by the criterion);
- identification of all places containing the type throughout the region which meet the threshold of significance; and
- for each criterion, assessment of the relative significance of each place containing the type.

These steps are illustrated diagrammatically in Figure 1.

To account for biophysical variation in ecosystems across the Region, the value assessment was carried out using sub-regions based on landform and rainfall parameters. Thresholds of significance and the relative significance of places for given types of values were determined both on a regional and a sub-regional basis. For some types of attributes uniform data across the Region was not

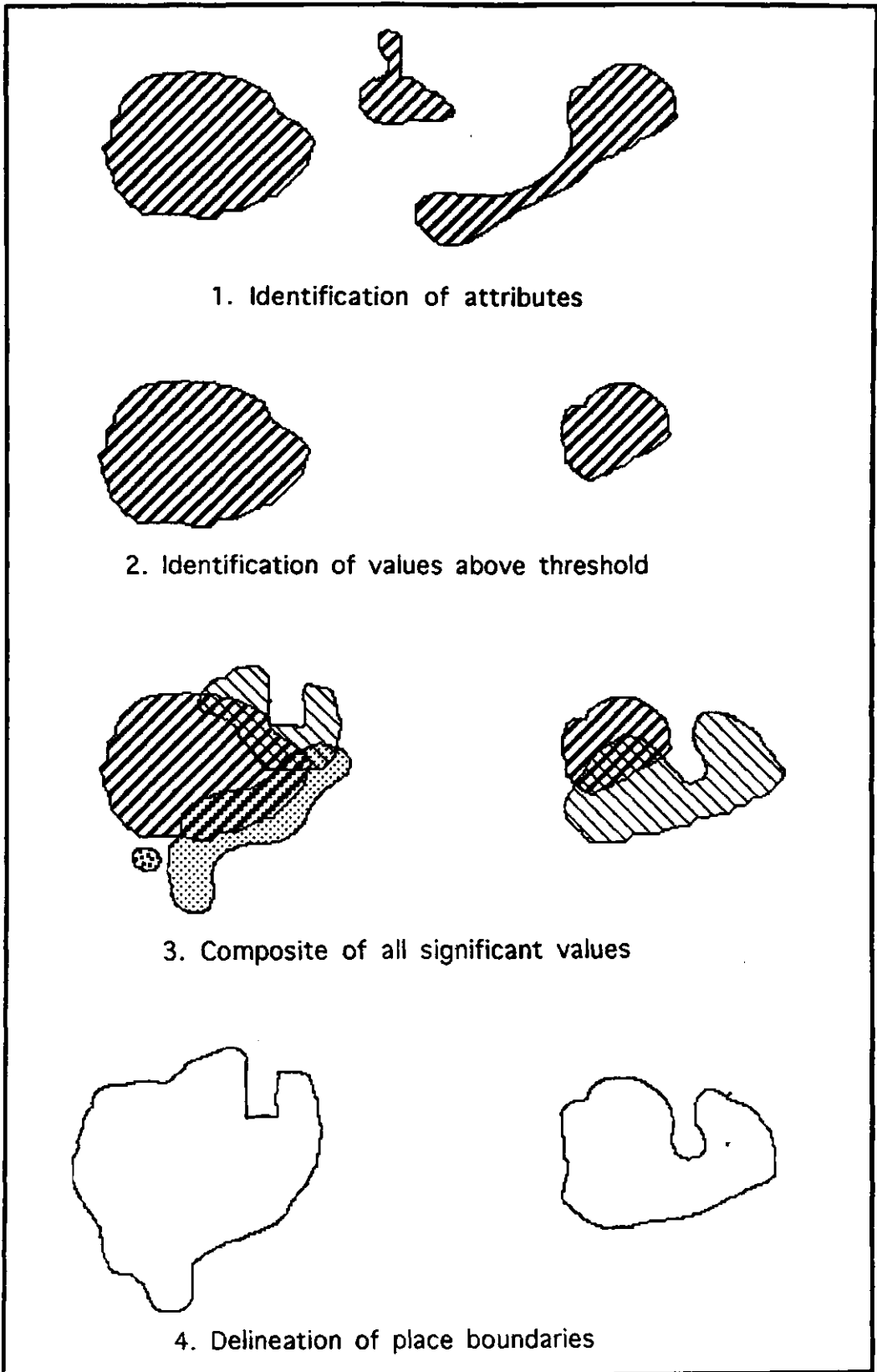


Figure 1 Steps in national estate values assessment.

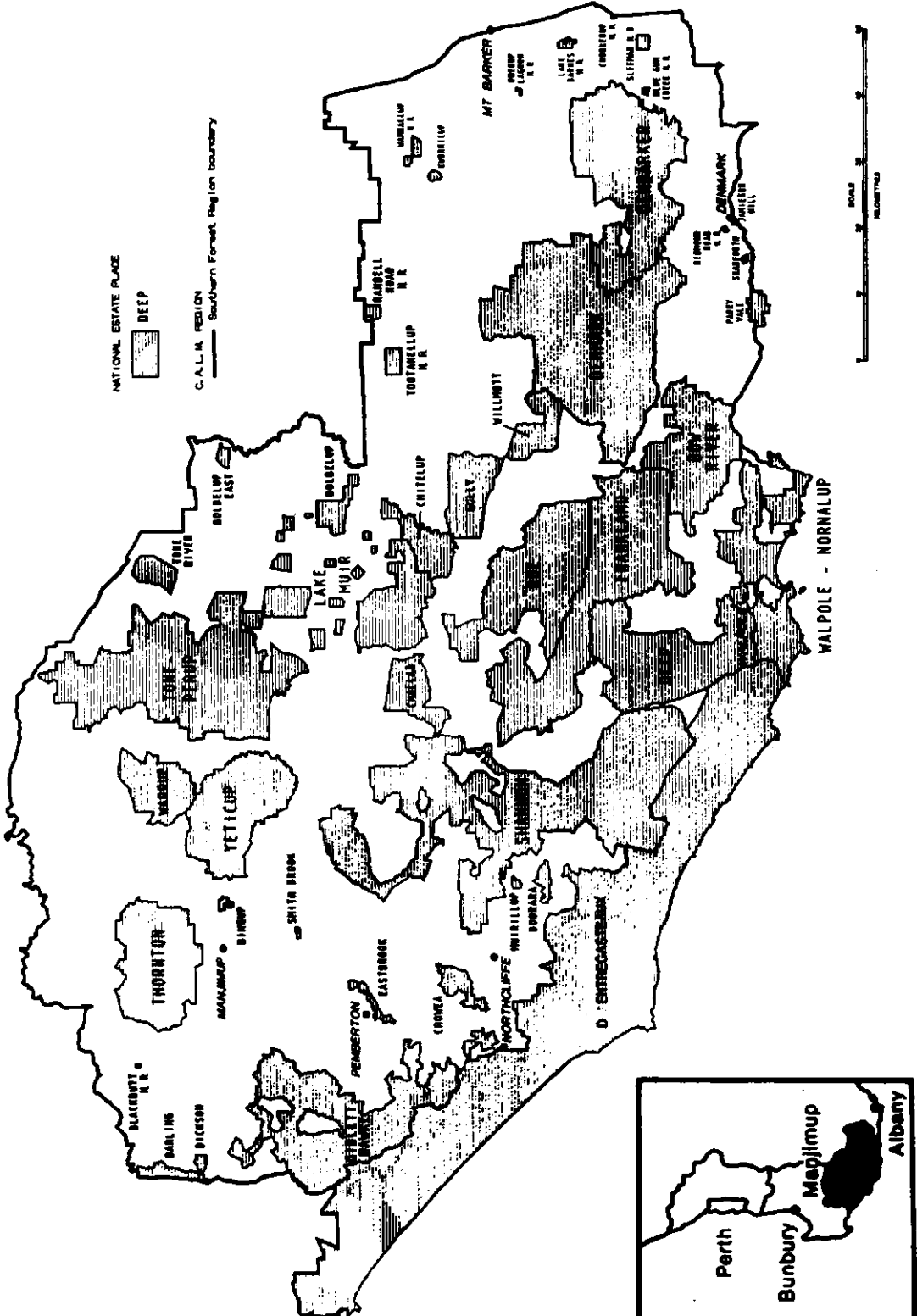


Figure 2 Places proposed for listing in the register of the National Estate south-west Western Australia.

available, but it was possible to make decisions about levels of significance. These types of attributes were generally related to site-specific values such as land form types, habitats of rare species, lakes and wetlands etc.

The results of each individual assessment of value were amalgamated to determine those areas which should be listed in the Register. Forty four places in the Southern Forest Region, as illustrated in Figure 2, totalling about 620 000 hectares across all land tenures, were found to meet the threshold for significance for a wide range of natural environment values either widespread across the landscape or more localised. These values included habitats of rare, uncommon, or biogeographically significant flora and fauna, habitats of gondwanic biota, areas with undisturbed ecosystems or with a high diversity of vegetation types or landform and soil types, areas of old growth forest or with good examples of particular vegetation communities or landforms, and areas with high wilderness quality. In a subsequent review of these areas, four places were removed from the assessment. Another forty individual sites were considered significant for their flora species.

Protection of national estate values

Once the areas of significance had been determined, and knowing the spatial distribution of values within each area, the Commission analysed the extent to which all identified values were represented within the existing nature conservation reserve system in the region. The sub-regional classification developed for the significance assessment was used as the basis for this analysis. For each general type of value in the region (e.g. abiotic ecosystem processes, vegetation diversity, lakes and wetlands, wilderness, granite outcrops etc), the Commission also developed guidelines for the protection of these values which could be used by CALM in its regional strategic and operational planning for forest management. Such guidelines do not prescribe how individual places should be managed, but provide an hierarchical series of general principles, based on the characteristics of each type of value and their sensitivity or resilience to various forms of disturbance. These guidelines provide for various levels of protection, commencing with the preferred option for maximum protection.

As part of a separate review of its forest management in the whole south-west area, CALM revised some of its key management practices to help protect national estate values in multiple-purpose forests, and propose to implement these changes as part of its normal forest management. A Memorandum of Understanding between the two organisations, developed as a result of the joint project, will provide the basis for CALM's management to protect national estate values in the region in future, and the basis on which the Commission will provide section 30 advice to the Commonwealth Government for future decisions involving the forests (e.g. woodchip export licences).

Public comment

The detailed reports on the AHC-CALM work were released for a 6 month public comment period. Methodological issues raised included the need for ground truthing, threshold levels for values, and the complicated nature of the methodology. Most comments related to management aspects, including those outside the Commission's jurisdiction (e.g. the need for the forest industry to be plantation based). The largest response to the work arose from private farmers in the Southern Forest Region whose properties had been identified within areas containing national estate values, and who feared Commonwealth or State Government intervention in their activities because of this. Following an assessment of comments received, the Commission decided not to include the analyses for soil and landform diversity, to allow for the development of improved methodologies for assessing these attributes.

Key elements of the regional assessment model

The model developed in Western Australia includes a number of key aspects which the Commission believes will allow better identification of heritage values and their improved protection in the long-term.

Explicit, consistent assessment criteria

The national estate criteria underpin the assessment of heritage values in the model. The criteria provide a consistent framework for assessing all aspects and periods of Australia's natural and cultural history, and allow multiple values of a place to be identified as well as places with a single value. Use of these assessment criteria permits all attributes of potential significance to be systematically considered, and ensures that values are not missed either because they are not obvious or because they are not well known.

Regional framework for identification

The model requires the systematic identification of all national estate values within an appropriate region, rather than considering the significance of places in isolation. This provides the best basis for determining thresholds of significance above which places are listed in the Register. For each type of attribute, this allows the accurate identification of all places in the region where this attribute is significant against the assessment criteria. The abundance and distribution of this value above the threshold level is thus known, as is the relative level of significance of each place in the Region with the value. The approach removes uncertainty about future listings in the region, and provides planners with a firmer basis for planning, particularly where planning is at an early stage, as it allows a wider consideration of alternatives to protect values. It also helps to reduce conflict arising from consideration of a single place. Arguments about

whether the place is significant at all or is unique can be resolved, because the regional knowledge about national estate values provides a framework for addressing the issues factually and in an appropriate context.

The model clearly separates the identification of national estate values from their protection. This provides a framework for making decisions about values solely against the national estate criteria, and allows relevant planning by state and local government authorities to be considered in the most appropriate context, i.e. that of protecting national estate values. The identification of places solely on their national estate value should also help to reduce community conflict arising from a lack of recognition of the conservation significance of a place because planning decisions have preceded and therefore precluded any assessment of value or because planning has been assumed, incorrectly, to adequately cover the assessment of value.

Regional framework for protection

The model assumes that national estate values should be protected in a regional context, rather than considering the protection of places in isolation. Regional protection of values includes specific recognition of the contribution of nature conservation reserves in protecting national estate values, or the degree of protection afforded places with cultural values through planning regulations, zoning, management of buildings under specific conservation plans etc. The model also includes specific recognition of the fact that national estate areas lying outside conservation reserves and which are part of multiple use public land, must be managed for a wide range of values, including national estate values.

Existing protection

By determining the level of protection afforded to national estate values in nature conservation reserves within a region, the model can specifically take account of existing planning and/or land use decisions by State Government (e.g. management plans, zoning etc). This type of analysis can lower the potential for protracted conflict about the use of individual places, by clearly establishing the extent to which the values of a place are already protected in the region.

A detailed analysis of existing protection also allows the quick identification of those types of values which are poorly or not protected, and thus likely to be most controversial in development decisions. The detailed regional knowledge of where such values are located and their relative level of significance provides a comprehensive framework which can assist State Governments to develop options for the protection of the values. For example, in the Southern Forest Region in Western Australia, the location of a large new national park, proposed by the State government, was determined in part from the detailed information about heritage values in the region resulting from the joint regional assessment using the Commission's assessment criteria.

Protection guidelines

The assessment of national estate values in the Southern Forest Region showed that many places contained a wide range of natural values. Although data was not available, it is likely that the areas will also contain a wide range of cultural values. This multiplicity of natural and cultural values could be expected for many forest areas in Australia. Where a wide range of values occur in the one area, the measures required to best protect one type of value may be detrimental to another. For example, while selective logging may retain the representativeness of some forest types, any logging will destroy the wilderness qualities. Regeneration to restore species diversity may destroy historical items such as tramlines or saw pits.

In order to assist forest managers make decisions about the use of land under their jurisdiction which will promote the protection of national estate values, an important part of the Commission's regional model is the development of guidelines for the protection of each specific type of value present in the region. The hierarchical guidelines provide flexibility in decision-making. Together with the detailed knowledge about values, the guidelines can help avoid values being ignored or unwittingly degraded or destroyed through ignorance or by focussing on individual places in isolation.

Agreement on a process for handling National Estate matters

The MOU provides an agreed basis with the relevant State Government authority for handling national estate matters in the region. These include agreement on the types and location of national estate values, agreement on the way in which the Commission will provide advice to the Commonwealth regarding decisions about listed places subject to forestry operations, agreement on the regional protection of national estate values, and an agreed basis for handling new information relevant to the National Estate. These measures should provide a more stable basis for land use planning and avoid the conflict that has characterised national estate issues in the past. In the long-term, the Commission believes this will result in better protection of the National Estate.

Cooperative project

The model is based on joint assessment of national estate values and discussion about their protection by the Commission and the relevant State Government authorities. It leads to understanding and agreement between the Commission and relevant State Government authorities about all places of significance. As the information is also public knowledge it can remove the basis for contention about values and provide a more informed basis for developing options where there is conflict about management. The joint nature of work carried out as part of the model should provide long-term benefits to both general planning and

resource development. By working closely with relevant authorities, the model reduces the potential for conflict between the state and Commonwealth governments over national estate places which are public land. The state authorities involved in the joint work gain a better understanding of the national estate and its identification, while the Commission gains a better understanding of relevant planning and land use matters.

Together with the comprehensive identification of national estate values, the working relationship developed between the Commission and other authorities means that for new development proposals, national estate matters can be addressed in a comprehensive way early in the planning process. Where projects require Commonwealth approval, early consideration of the national estate in the project development is likely to minimise uncertainties about or delays in decision-making at the Commonwealth level.

On-going refinement of the methodology and information base

The Commission is confident that the Southern Forest Region project has identified all major, extensive national estate values in the region. However, there is also clear provision within the model to incorporate both substantial new information and changes in community perceptions concerning national estate values. Furthermore, while also confident that the model for regional assessment as developed in the Southern Forest Region project is both valid and robust, the Commission has sought feedback from both the general and scientific communities for improvements to the model in publishing its methodology as part of the Draft Report.

Future directions

Cultural values

Developing a methodology for assessing the cultural values of forests follows a similar process to that for assessing their natural values. However human associations with Australia's forested environments is a relatively recent area of research and management interest so the data base contains many gaps. More baseline survey work is needed in most states before there will be sufficient data to determine their national estate values. This situation is being redressed with archaeological surveys in progress in the southern forests of Western Australia and soon to commence in East Gippsland.

The cultural signature of forests encompasses both tangible and intangible features. Archaeological sites relating to Aboriginal and European use of forests are often visible and can be recorded and mapped. Structures such as sawmills or huts are also easily identifiable and their significance can be assessed in terms of the historic themes they represent. It is much more difficult to assess the

social values that Aboriginal and white communities place on forests. These frequently leave no physical traces or they are so subtle so as to not be discernible. Sites of significance to Aboriginal people may be natural landscape features which can only be identified through oral history research with elders.

The significance of Aboriginal and historic sites is usually measured in terms of their ability to tell a story about the past. Regional assessment aims to identify which sites and places have the greatest potential to elucidate the various components of this story. The types of values likely to be considered are examples of rare or uncommon site types at a regional or sub-regional level; and sites exhibiting particular human adaptations to changing environments and combinations of different site types or different themes within a specified area.

Integration of cultural and Natural values

As cultural values were not assessed during the Southern Forest Region project, the methodology for the integration of assessment processes for cultural and natural values is yet to be developed. To a large extent, it is expected that these processes will be complementary, rather than supplementary. The different types of information on which the assessment of cultural values and natural values is based is such that the two types of values can be assessed independently. The two processes would preferably, but not necessarily, be undertaken concurrently. However, it is also clear that there are many places where both natural and cultural values are significant, and moreover, the conjunction of these values adds to the significance of the place. To appreciate the significance of these types of places fully, it will be necessary to firstly identify these places, and then to assess the significance of the interactions of the combinations of values. The development of a methodology for this type of assessment is likely to provide challenges to both the cultural and natural perspectives of heritage.

Community involvement

It is likely that most regional projects will involve a range of land tenures and a wide range of groups with some interest in the area. It is essential that mechanisms be set up to allow adequate consultation and community input as part of the model in order to identify their values, and seek advice on how information is collected and stored. This is particularly important for social values, which may only be well-recognised within the local community. The Commission is committed to working with the community to identify and conserve the National Estate and to conducting its business as openly as possible. It is currently developing, with others, mechanisms for incorporating community participation in regional assessments.

The Commission agreed with the Western Australian Farmers Federation in March 1992 that before any further assessment of the South-west region took

place, the Commission and the Federation, in consultation with landholder representatives, would work to develop a model for future listings of farmland. Private landholders had been concerned about the impact of possible listing on the Register of the National Estate. The Heritage Model Committee was thus formed and has since been working on a model for community involvement in future Australian Heritage Commission regional assessments. The Committee includes members of the Commission, the Federation, Department of Conservation and Land Management, The Country Shire Council Association, the Pastoralist and Graziers Association, Australian Conservation Foundation, the Southern Heritage Action Group, and the Denmark Heritage Action Committee.

The model will be implemented on a trial basis and will be flexible enough to be adapted to specific regional needs. Community reference groups established in each state will have input to the identification of national estate values, and will also have the opportunity to review draft reports. Participation by conservationists, technical experts and the wider community will be available at several stages throughout the regional assessment process. A Technical Advisory Committee will advise on available data across the range of natural cultural and historical values.

Conclusion

The regional assessment of national estate values is complex, and best carried out by experts with appropriate knowledge about the application of the assessment criteria and experts with a detailed understanding of each type of attribute. It requires multidisciplinary teams of people with expertise in the natural and cultural environments, and the compilation and analysis of data from a wide range of disparate sources.

When carrying out systematic work to identify national estate values on a regional basis, the information available may vary in quality and quantity across the region. Although the national estate criteria can be applied to data at a range of detail, the most appropriate level needs to be determined jointly between parties participating in applying the model. Where it is agreed that insufficient data is available for any systematic analysis of particular attributes, agreement will be needed on the nature and type of data which should be collected in surveys before the model can be applied. Even with broad-scale data, however, it is still possible for national estate assessment to be carried out at a level which is useful for planners.

The Australian Heritage Commission believes that the regional model described in this paper provides a framework for the national estate to be incorporated into forest management in a way which allows the Commission to fulfil its legislative functions, results in better over-all protection of national estate values, and

reduces the potential for conflict about individual places listed in the Register. The challenge now is to carry out the work in other forest regions in Australia and fully integrate the assessment of cultural and natural values.

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Appendix 1. Criteria for the Register of the National Estate.

Without limiting the generality of sub-section (1) of the Australian Heritage Commission Act, a place that is a component of the natural or cultural environment of Australia is to be taken to be a place included in the national estate if it has significance or other special value for future generations as well as for the present community because of:

A: its importance in the course, or pattern, of Australia's natural or cultural history

- A.1 Importance in the evolution of Australian flora, fauna, landscapes or climate.
- A.2 Importance in maintaining existing processes or natural systems at the regional or national scale.
- A.3 Importance in exhibiting unusual richness or diversity of flora, fauna, landscapes or cultural features.
- A.4 Importance for association with events, developments or cultural phases which have had a significant role in the human occupation and evolution of the nation, state, region or community.

B: its possession of uncommon, rare or endangered aspects of Australia's natural or cultural history

- B.1 Importance for rare, endangered or uncommon flora, fauna, communities, ecosystems, natural landscapes or phenomena, or as a wilderness.
- B.2 Importance in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practised, in danger of being lost, or of exceptional interest.

C: its potential to yield information that will contribute to an understanding of Australia's natural or cultural history

- C.1 Importance for information contributing to a wider understanding of Australian natural history, by virtue of its use as a research site, teaching site, type locality, reference or benchmark site.
- C.2 Importance for information contributing to a wider understanding of the history of human occupation of Australia.

D: its importance in demonstrating the principal characteristics of:

- (i) a class of Australia's natural or cultural places; or
- (ii) a class of Australia's natural or cultural environments

- D.1 Importance in demonstrating the principal characteristics of the range of landscapes, environments or ecosystems, the attributes of which identify them as being characteristic of their class.
- D.2 Importance in demonstrating the principal characteristics of the range of human activities in the Australian environment (including way of life, custom, process, land-use, function, design or technique).

E: its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group

- E.1 Importance for a community for aesthetic characteristics held in high esteem or otherwise valued by the community.

F: its importance in demonstrating a high degree of creative or technical achievement at a particular period

- F.1 Importance for its technical, creative, design or artistic excellence, innovation or achievement.

G: its strong or special associations with a particular community or cultural group for social, cultural or spiritual reasons

- G.1 Importance as a place highly valued by a community for reasons of religious, spiritual, symbolic, cultural, educational, or social associations.

H: its special association with the life or works of a person, or group of persons, of importance in Australia's natural or cultural history

- H.1 Importance for close associations with individuals whose activities have been significant within the history of the nation, state or region.
-

Appendix 2. Attributes relevant to assessment criteria in Southern Forest Region, Western Australia

Criterion and Relevant attributes

A.1 (past processes natural)

- Flora and fauna species at limits of range
- Relic or disjunct populations of species
- Natural refugia for flora/fauna
- Gondwanic species of flora or fauna
- Endemic species of flora and fauna
- Geomorphological features which are evidence of past landform processes
- Fossil sites

A.2 (existing processes/ natural systems)

- Undisturbed catchments/subcatchments
- Wetlands which are habitat to migratory faunal species
- Habitat important for maintenance of faunal species
- Ecosystems little affected by human disturbance and which function in a natural or near-natural manner
- Areas where geomorphological processes are functioning in a natural or near-natural manner

A.3 (richness or diversity)

- Natural vegetation types (structural classification)
- Natural vegetation types (floristic classification)
- Landforms/land systems
- Flora or fauna species
- Cultural features

A.4 (human occupation/cultural evolution)

- Archaeological sites
- Historic sites - forest industry
- Historic sites - group settlement
- Historic sites - coastal exploration

B.1 (rare, endangered or uncommon natural)

- Flora species (higher plants)
- Fauna species (vertebrates and invertebrates)
- Natural vegetation communities
- Undisturbed forests and woodlands
- Geomorphological/landform features
- Wilderness

B.2 (rare or threatened cultural)

- Prehistoric sites
- Historic sites - forest industry
- Historic sites - group settlement

C.1 (research potential natural)

- Type localities faunal species
- Type localities rare flora species
- Research sites
- Undisturbed ecosystems

C.2 (research potential cultural)

- Archaeological sites
- Historic sites

D.1 (representativeness natural)

- Natural vegetation types (structural classification)
- Natural vegetation types (floristic classification)
- Natural vegetation assemblages
- Faunal habitat
- Landforms
- Geomorphological features

D.2 (representativeness cultural)

- Archaeological sites
- Historic sites - forest industry
- Historic sites - group settlement

E.1 (aesthetic value)

- Rivers
- Undisturbed forest
- Landscape diversity

F.1 (creative, technical achievement)

- Historic sites

H.1 (association with people)

- Association with early explorers
-

CHAPTER 16

'HOW MANY SHIPS SAIL IN THE FOREST?' INVENTORY OF HISTORIC PLACES IN TASMANIA'S FORESTS.

Anne McConnell

Introduction

Until the mid 1980s the archaeology and history of Tasmania's forests had been little researched. More recent research focussing on wood-production forests for management reasons has revealed that throughout the forests there are numerous sites, both Aboriginal and historic. These research findings have radically altered our earlier understanding of the Aboriginal history of Tasmania, and have assisted in rewriting the post-contact (c.1803) history of the island. They have produced a history no longer heavily biased towards what was happening in the urban areas, and that can now include everyday men and women and their culture and working lives. Research in the Tasmanian World Heritage Area has shown that the forests were used extensively from early contact for their timber, mining, trapping and snaring, grazing and other small scale pastoral and agricultural activities. The physical remains of these activities, as well as of early exploration and frontier settlement, and the provision of government services such as early forest management, transport, and water and energy supply remain in the forest, often comparatively well preserved.

This paper examines the approach that has been taken by the Tasmanian Forestry Commission to provide information on the historic heritage of wood-production and other State forests, primarily for management purposes. It focuses on what has been considered a first level of data collection, achieved through the Historic Sites Inventory Project. This project was conducted by the Commission between 1989 and 1991 with funding from the National Estate Grants Programme. It was an 18 month project conducted on a regional basis and reported in Scripps (1990), Gaughwin (1991) and Parham (1992). The resultant Inventory is regarded as a 'first approximation' to the real nature of the historic heritage of the wood-production forests, but has been found to have been an invaluable initial stage in acquiring the necessary data for the management of these sites.

In this paper the terms 'historic heritage', or 'historic cultural heritage or resource' are used to refer to places, or physical remains, resulting from past

human activities. In general, they represent past lifeways and activities no longer practised. This is a narrower definition than has been used elsewhere, but reflects the current management objectives and policy of the Tasmanian Forestry Commission and forest industry.

Need for inventory

Since 1988 the Tasmanian Forestry Commission has had a formal programme for cultural heritage management, with one full time archaeologist (the author) employed to oversee the programme. The programme was initiated following the implementation of the *Forest Practices Code* (Forestry Commission 1987), through which there is an undertaking to protect significant cultural heritage (Aboriginal and historic) in wood-production areas of the State. As an acknowledged multiple land-use manager and under the *Public Land (Administration and Forests) Act* 1991 the Commission is also committed to the sound management of the range of resources, including cultural heritage, of Tasmanian State forests. The Historic Sites Inventory Project was undertaken largely to provide data to enable these management objectives to be achieved.

When the cultural heritage management (CHM) programme for forests commenced in Tasmania in early 1988, there was little documented easily accessible information, suitable for management purposes, about the historic cultural heritage of the wood-production forests of the State. A review resulted in a list of three sites from the Register of the National Estate, and eight sites from the Tasmanian Historic Sites Catalogue (THASC) of the Department of Parks, Wildlife and Heritage (DPWH) register. No sites had a National Trust classification.

The DPWH register at this stage only contained a couple of hundred sites. Since there is no legislation to protect historic cultural heritage in Tasmania, this was in reality only a *de facto* register in the sense that there was little systematic entering of sites. It was a place where sites located by DPWH staff, or otherwise brought to the attention of the Department, were listed. Other data sources existed but had not been systematically culled for sites. For example, studies such as Truscott (1984) and Gowlland (1973) listed numbers of historic sites or places, but these had never been entered in the Catalogue. Quite clearly there were more than 11 historic sites in the forests. If significant sites were to be protected, some sort of list was required that would indicate where and what they were. The question then was how to achieve this rapidly, cost effectively for all wood-production forests in the State. Due to the strategy of dispersed coupe logging in Tasmanian forests, one does not have the luxury of being able to research smaller areas, such as State forests or forest blocks, systematically and one at a time. Furthermore, systematic archaeological field survey and

recording is extremely time consuming and expensive, and without prior historic research considerable time and effort can be spent surveying archaeologically unproductive areas of forest, while productive areas may be missed. This has been clearly shown in some US Forest Service studies (eg. Karamanski 1985). As recent Tasmanian research (Kostoglou 1991) has also shown, that without historic data it is much more difficult to locate sites through survey, extremely difficult to interpret them, and impossible to assess their significance,

It became apparent that a short-cut method, based primarily on historic research was required. Rather than a register of located and documented sites, perhaps we needed to aim for an inventory of places: dots on a map that flagged the existence of historical sites, compiled from whatever sources were available, but without resorting to field survey. It was considered that the process would need some field checking to assess reliability of the sources and to get some idea of the nature and condition of the sites; information probably not obtainable from the primary documentary sources. Based on my experience within the Commission, it was also apparent that there was considerable collective knowledge of the historic heritage of the forests held by Forestry Commission and forest industry employees, acquired from a long familiarity with the forests. As well, certain individuals within the community had valuable specialised knowledge in this area.

The inventory process

The project commenced when funding became available in early 1989. Until this period, any sites I had been shown or told of, or located through management oriented research projects (eg, Bannear 1991), were put on the DPWH register. The same approach was also being adopted by other archaeologists at DPWH.

In order to acquire the data in the shortest time, yet have useful historic contextual data and be able to meld the results into a State-wide inventory, it was decided to carry out the project regionally, with each regional study being undertaken concurrently. Although it was not possible to carry out the projects at the same time due to the lack of availability of suitably qualified people, separate inventories were produced for the three commonly recognised regions (north-east, north-west and south-east) of the State. The regions conformed roughly to the Forestry Commission regions, but the actual boundaries where possible, were boundaries of historical activity. Because the data was primarily to be used for forest management, each regional study concentrated on documenting sites in wood-production forests and other State forests. Sites outside this land tenure were included in the inventory if information was available, but they were not researched further.

Each regional inventory was approached in the following manner. Initial

documentary research was carried out, mainly using secondary sources and review documents to establish an historical framework for each region, and to determine what type of sites might be located in the region, where sites might be concentrated, and what other archival resources might be useful. The next stage was to interview as many Forestry Commission and forest industry field staff as possible, as well as local residents known to have an interest in historic heritage. During this stage locations obtained were noted on maps, where possible having the interviewee indicate site locations on the relevant maps during the interview. In some cases interviews were conducted in the field, with sites being inspected on the ground. Index cards with summary data for each site were made up, and data added from subsequent interviews, site visits and/or archival research. All sites listed were entered in the THASC catalogue.

Using the information obtained from these two steps, further archival research was carried out to obtain more information for sites already listed, to note new sites referred to in the literature, and to provide data for the regional, contextual, history. In some cases, where an informant was known to have detailed information or information of particular interest, the oral interviews were taped. The final stage was to produce a report containing the contextual regional history and the regional inventory. The reports also describe the project methodology and provide some analysis of the results. Where there was adequate data an 'interim' assessment of significance was made. Recommendations were also made for site management where it was considered appropriate, and for future research to usefully develop the inventories for forest management. As part of the project, site recording forms for final documentation of site data were designed. The summary management information was entered on a computer data base to aid management and to produce site distribution maps and other spatial documentation and analysis using the Commission's ARC/INFO Geographical Information System (GIS).

Evaluating the inventory project and process

How well did the process work? The following discussion evaluates the project with respect to what we learned from it and how well the actual approach worked.

Improvement of the knowledge base

At the completion of the project a total of 1,410 sites were included on the inventory, with some two-thirds of these being in wood-production or other State forest. Over 1,000 of these were new additions to the THASC register. This represented approximately a threefold increase in our knowledge of the historic cultural heritage of the State and more than a hundredfold increase in our knowledge of the historic cultural heritage of the forests.

The computerised inventory for the State currently now contains records of 1657 sites. (The additional 247 sites are not in wood-production forest but were already on the THASC register, or have been recorded through more recent forest archaeological research). It should be noted that although each record equates to a 'site', a site is broadly defined and may range from a single historic object, to the remains of a single activity, eg. a tramway, or farm, to a entire mining field. It was not considered of any benefit in the project, or for management purposes, to attempt a rigorous definition of 'site'. As an indication of the complexity and size of the place or site being recorded, sites were categorised as a 'site', 'site complex', or 'cultural landscape'.

It can be seen from Table 1 that some 64 per cent of sites result from historic mining or timber getting and processing activities. The next largest category are settlement sites, however the majority of these are not located in forests. The next most commonly represented sites are related to agriculture and transport. Many of the agricultural sites in forests represent small scale pastoral activities, and the majority of transport sites are tracks relating to exploration or to mining.

The analysis of site types also shows that from contact to present, a diversity of activities were carried out in the forests, many normally considered to be generally restricted to urban areas or transport foci such as ports outside the forests. As the regional histories and sites of the inventory show, these forest based activities, with the exception of mining and timber getting, were primarily the activities of the common people, as opposed to the rich and famous. They are the legacy of that part of the population who are traditionally under-represented in our histories and whose heritage has largely been ignored to date. Because so little information on these people is recorded in contemporary and traditional histories, the cultural resource is of major importance in telling their story.

Table 1 also indicates the land tenure/status of the sites recorded. The study clearly focussed on wood-production forest and other State forest with 729 sites (44 per cent) in these areas which account for about 30 per cent of Tasmania's land area. This is of interest since the forests were thought to have had only minor historic use. It can also be seen that 18 sites are protected within Forest Reserves, although only in one case was the Reserve created for the protection and/or promotion of its cultural heritage.

Effectiveness in locating and documenting sites

The project was certainly effective in locating new sites but how effective was it in locating all sites in the forests? Although the project was never intended to locate all the historic cultural heritage, it is useful to have an idea of its performance. An estimation is provided by comparing results for timber industry sites

TABLE 1: ANALYSIS OF SELECT DATA CATEGORIES IN THE INVENTORY

Based on the full computer inventory of 1657 records.

	Number of sites	Proportion (%)
Site type		
Contact/exploration	8	0.5
Settlement	222	13.4
Cemetery/burial	18	1.1
Events/persons	13	0.8
Recreation/sport	24	1.4
Defence	3	0.2
Services	51	3.1
Transport	126	7.6
Convict	51	3.1
Agriculture	122	7.4
Hunting/trapping	59	3.6
Forestry/timber industry	642	38.7
Mining/quarrying	421	25.4
Other primary industry	7	0.4
Manufacturing/processing	30	1.8
Other	<u>35</u>	<u>2.1</u>
TOTAL	1832	100.0

(Note: Approximately 11 per cent of sites have more than one type.)

Land Tenure/Status		
State forest	671	
Forest Reserve	18	
Timber Reserve	11	
Crown Land	119	
National Park and other DPWH reserves	9	
World Heritage Area	8	
Protected Areas (incl. Historic Sites)	16	
Private (major forestry companies)	29	
Other Private (incl. non-forest)	354	
Not recorded	61	
Other government-managed land	<u>361</u>	
TOTAL	1657	

Reliability		
A - site exists and location accurate	782	47.2
B - site exists and location approximate	321	19.4
C - existence and location of site to be determined	64	3.9
Not determined	<u>490</u>	<u>29.5</u>
TOTAL assessed	1657	100.0

Significance Level		
Local	640	38.6
Regional	77	4.6
State	10	0.6
National	1	0.1
International	0	0
No significance attributed	<u>929</u>	<u>56.1</u>
TOTAL	1657	100.0

and mining sites, where more recent intensive research methods using archival, oral information and systematic field survey have been used. If Gaughwin's (1991) list of timber industry sites for the Mt Horror area, or the Sideling Range are compared with the results from Kostoglou (1992; in press), then the inventory appears to represent approximately 10 per cent of the actual sites in the forest. Comparison of mining site numbers from Gaughwin (1991) and Coroneos (1992) for the Lisle-Denison Goldfields, indicates the same level of recovery for the inventory.

This may appear to be fairly poor recovery, however a site in the inventory frequently encapsulates several individual sites recorded in the more intensive surveys. For example while Gaughwin (1991) may have recorded the Panama Goldfield as one site, Coroneos (1992) may have recorded some 50 individual sites within the same area. For management purposes, the inventory could be considered to have flagged, rather than recorded, a much higher proportion of the sum total of historic heritage of the forests, possibly as much as 40-50 per cent, although this is a difficult figure to determine.

In considering the effectiveness with respect to percentage retrieval, it is also instructive to compare times and costs of the different approaches. Bearing in mind that the inventory was designed to retrieve the easily accessible data rapidly, it can be considered to have worked well. The Historic Sites Inventory recovered about 1,410 sites in 18 months, or approximately 80 sites per month. However, other studies (Bannear 1991; Kostoglou 1991; Coroneos 1992) which have had greater success in percentage recovery have managed to recover only about 10 sites per month.

Implications for management

As well as enabling a considerable number of historic sites to be identified and the necessity for protection assessed prior to operations, the overall figures also give some idea of the rarity of certain types of sites, hence flagging needs for protection of representative sites. For example, the inventory, together with the regional histories, suggests that heritage related to early exploration, convict activities, and trapping and snaring, are all fairly poorly represented in the forests, yet will also be poorly represented in other areas. As a result, this part of the historic heritage can be given a relatively high priority for protection.

Similar decisions can also be made on the basis of age. The inventory, and other recent research (Bannear 1991; Kostoglou 1991, 1992, in press; Coroneos 1992) have indicated that nineteenth century sites, particularly well-preserved ones, are also fairly rare in wood-production forests, and hence should have a high priority for protection. This type of decision making could be more reliable with similar data for non-forested areas.

Analysis of the inventory also indicates the significance of sites. Bearing in mind that only 44 per cent of sites have been ascribed significance, it can be seen from Table 2 that about 39 per cent of sites have local significance, while only 5 per cent have regional level significance, and only 0.06 per cent have been ascribed State level significance. The remaining 56 per cent had inadequate information for assessment of significance. Where significance has been given, it is considered an interim assessment, primarily because more site data is needed for almost all sites, and because the comparative record is biased heavily towards forest sites, and we have little idea of the complete resource with respect to almost all site types, or themes, within the State.

Despite its limitations, the significance assessment in the inventory has been extremely valuable in making decisions in the new planning process being undertaken by the Forestry Commission, through the development of Management Decision Classification (MDC) maps (Forestry Commission 1991). Sites that have been ascribed regional and State level significance (Gaughwin 1992), level 3 and 4 significance in Scripps (1990) and A1 significance in Parham (1992), have been recommended for inclusion on the MDC maps as Special Management Zones for cultural heritage values. This means that the protection of cultural heritage values is a management priority within them.

Evaluation of methodology

Given the nature of the project, and the sources used, it is also of interest to look at where data were obtained. Of the 1410 sites in the project inventory, 430 sites (31 per cent) were determined through oral sources alone and 394 sites (28 per cent) from documentary sources alone. Only 267 sites were located through both oral and documentary information. This indicates the importance of oral sources for locating data. (The 3 per cent of sites that have no oral or documentary sources attributed to them were primarily located through field survey, although there is likely to be oral and documentary information for them).

One aspect that was considered to be inadequately covered in the project was the field checking of sites. It had been intended that about 20 per cent of sites located would be field checked. This proved, except in the case of the north-east region, to be unrealistic in the time available. In the north-west regional study only about 15 per cent of sites were field checked, and for the south-east region inventory no sites were field checked. Some 900 sites are listed as requiring inspection for this purpose. It is considered that the data reliability and our understanding of the nature of the different site types could have been markedly improved with more field checking.

Reliability of inventory data

In evaluating the results, and for management purposes, it was found useful to have some indicator of reliability with respect to a site's existence and location.

Field inspections provided some indication of the reliability of the different sources. In some cases the reliability could be established from the nature of the source. For example Mines Department maps provided accurate information about the existence of a site, while a secondary source might discuss a real site, but provide very imprecise information about its location.

A reliability indicator scale was established, and reliability recorded for each site. Again, from Table 2, it can be seen that while reliability is only recorded for 1167 sites, about 67 per cent are considered to exist and have reliable locations, while about 28 per cent are known to be real sites but lack precise locations. The remaining 17 per cent are sites whose existence and location need to be established; these have been included as an appendix rather than entered on the main THASC register.

Although such results may be unacceptable for a more routine research project, the levels of reliability are considered acceptable for the inventory project. The primary aim of putting dots on a map has been achieved and we know how reliable those dots are. The reliability of location information can be dramatically improved by field checking over time by archaeological and other field staff.

Conclusions

Given that the project has recovered between an estimated 10 and 50 per cent of the total number of sites in the forests, is there any advantage in pursuing the inventory process to increase the recovery level? In reviewing the results and talking with field staff, it is apparent that more information could be acquired by further inventory, and as already suggested the results would have been improved by more field checking. This indicates that more time should have been allowed initially for the project, possibly 9 rather than 6 months per region. The inventory will not be reactivated however, as field checking and the retrieval of additional oral information can be achieved through routine visits by trained field staff, and by archaeologists working on more systematic projects.

The inventory has been useful in highlighting directions for future research. It has indicated gaps in the information base, and themes that urgently need addressing. Clearly indicated gaps in the inventory are a number of particular regions for which there seems to be little documentary or oral information about historic places, for example the Eastern Tiers (Parham 1992). Another major gap is the absence of parallel inventory information for other areas of Tasmania. The World Heritage Areas and some National Parks have been similarly researched although the data are mainly in a different format. However there is a poor understanding of the historic heritage of the coastline, agricultural land, other Crown land and urban areas. Such information is essential for meaningful significance assessment. Although there is a preference for studies which

document the total historic heritage of an area from a forest management point of view, the extremely large percentage of timber industry sites revealed priorities that are guiding further research.

Although the inventory has been an extremely cost effective and useful initial step, it is important to build on this and develop new strategies to increase the knowledge of the historic resource of the forest and ensure that its important elements are protected from logging and other impacts. It is also necessary to fill in the gaps in our historic heritage knowledge for parts of the State for which an inventory has not yet been conducted, in order to be able to conduct useful and reliable significance assessments. The richness of historic cultural heritage in Tasmanian forests as revealed through the Historic Site Inventory Project, is likely to be paralleled in other Australian forests and has therefore implications for the current multiple use and sustainable development objectives of Australian forest management.

Finally, to answer our original question ('how many ships sail in the forest?'). The inventory can provide an answer: only one ship sailed, or rather sailed, in the forest (a forest no longer), and it is unlikely that there were more. The ship in question was the *Dorset Dredge*, a tin mining dredge that worked its way progressively up the waterways and associated alluvial sediments of the northeast of the State from about 1942 until it was finally abandoned in a tributary of the Ringarooma River in about 1972.

But what of the real question being asked? The title of this paper, 'How many ships sail in the forest?', is from an English folk song which reflectively questions the loss of the vast oak forests of Britain, that became the exploration, merchant, and naval fleets of England. We may know how many ships are *in* the Tasmanian forests, but we do not know yet how many ships were *made* from them. We know whaling and cargo ships were made from the blue gum and huon pine of Tasmania's forests and many Aboriginal canoes were constructed of forest tea tree. But how many, how and by whom? To extend the question more generally - what do the sites listed in the inventory tell us about the history of the forests? Our understanding of how the forests were used in the past needs development. Although the inventory and regional histories can be used as a starting point and have been useful for the management of the historic heritage, we should not lose sight of what is generally considered to be the ultimate goal of heritage conservation - to understand the past.

Acknowledgments

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APPENDIX. DATA RECORDED IN THE INVENTORY

For administration and computerisation

THASC Number	
Site Name	
Site Location	(1:100,000 map sheet number and eight figure grid reference)
Address	
Coupe Number	
Reliability	(3 levels)
Site Type	(16 options)
Site Components	(29 options)
Site Complexity	(3 levels)
Site Function	
Date Commencement	
Date Ended	
AHC Theme Number	
Land Tenure/Status	(15 options)
Site Area Subject to Mining Lease	(Y/N)
Land Manager/Owner	(13 options and name and address)
Heritage or Other Listing/Classification	(4 options)
Site Condition - Preservation	(5 options)
Site Condition - Disturbance	(6 options)
Site Condition - Potential disturbance	(6 options)
Site Significance	(matrix of 5 levels and 6 types)
Site Significance reliability	(3 levels)
Recommendations	(7 options)
Data Sources - Oral	(name and date)
Data Sources - Documentary	(Author name and data)
This Record	(who by, date and project number)
Site Requires Inspection	(Y/N)
Site Inspection Completed	(Y/N)
Level of Record	(5 options)
Data Available	(5 options)
Site Management Record (Action/by/date)	

Major fields using blocks of text

Site Description	- general site/site complex - site features - site environment
Site Condition	- site general - features - visibility
Historic Context sources	- oral - documentary
Evaluation/Recommendations	- site data reliability - site values - site significance - recommendations

CHAPTER 17

FOREST HISTORY AT THE NATIONAL MUSEUM

Ruth Lane

The *People and the Environment* approach adopted by the Museum's planners reflects a conscious attempt to avoid some of the pitfalls of conventional history and natural history museums in separating human and natural history. Until very recently, objects made by Aboriginal people have been displayed in most Australian museums in taxonomic classifications comparable to flora and fauna. While Aboriginal people were portrayed as part of the natural world, non-Aboriginal people were generally represented at the other extreme, as completely unconnected with nature. Today, the need for a national institution that explores the relationship between our human and environmental histories (and futures) has never been greater and the interdisciplinary framework of the National Museum places it in a unique position to play such a role.

This paper presents five examples of recent collections in the Museum that set forest history in the broader context of people's interaction with the Australian environment. The objects in the Museum's collections are all made by people, and it is the human context of their manufacture and use that allows these relationships to be explored.

Documenting the conservation movement in Australia

At the beginning of the conservationists' blockade of the Franklin River in 1982, an aluminium garden shed was erected on a pontoon and moored to the river bank. It was fitted out with radio equipment and became the geographic focus of the blockade. In 1992, ten years later, this shed was transferred to the National Museum to become part of a collection relating to conservation campaigns in Tasmania. Until its removal to Canberra, the Franklin River communications shed stood in the grounds of the Wilderness Society office in Hobart where it was used for storing wood. It still bears markings and graffiti from its time on the Gordon River below Franklin and would make an excellent centre piece in any display about the Franklin campaign.



Figure 1 Communications shed used by the Tasmanian Wilderness Society to coordinate the conservationists' blockade of the Franklin River in 1982.
Photo: Courtesy of the Wilderness Society

Since 1972, when the United Tasmania Group formed in an effort to prevent the Tasmanian Hydro-Electric commission from flooding Lake Pedder, Tasmania has been very significant to the growth of political power for the conservation movement nationally. Conservation campaigns have greatly influenced the popular perceptions of Australian forests so documenting the history of the conservation movement in Australia is an important task for the Museum's environment section.

To document the role of the communications shed in the conservationists' blockade of the Franklin River, oral history interviews were recorded with Cathie Plowman, one of two women instrumental in organising the blockade, and Paul Dimmick, who fitted out the shed with radio equipment and lived in it for the duration of the blockade. These narratives help to relate the shed to the broader context of the conservationists' campaign to stop the damming of the Gordon River below the Franklin.

The collections relating to the Franklin River blockade came about as a result of curators writing to environment groups around the country asking if they wanted to donate memorabilia. Various groups donated material relating to the activities of particular prominent individuals in the conservation movement in Tasmania.

Bushwalking and outdoor recreation

Myles Dunphy, bushwalker and conservationist, was both an innovator of equipment and very active in lobbying for the formation of new national parks in New South Wales from the 1920s. The Dunphy family donated a large assortment of his bushwalking and camping equipment. Much of this equipment is improvised and the collection includes a tent which Dunphy designed himself and patented. Dunphy was very active in the Mountain Trails Club which was based in Sydney. This association between bushwalkers, their clubs, and the conservation lobby has been an important one in Australia and is documented in other collections as well.



Figure 2 Sylvia Courtney crossing the Kiewa River in Victoria in 1933.
Photo: Courtesy of the Centre for Gippsland Studies

In 1992 two consultants were hired to help collect material to document the involvement of women in bushwalking and outdoor recreation - one to work on a project concentrating on Gippsland and the Australian Alps and the other, a project based in Tasmania. Both projects targeted women who were active between the 1920s and the 1950s and both entailed recording oral history interviews as well as identifying objects and photographs which people were prepared to donate to the Museum.

In the course of the oral history interviews, some of the sentiments that these women felt towards particular places were articulated, along with their feelings about the changes that had taken place. There were mixed responses to national parks. Some of the women regretted that they could no longer ride pack horses through particular country since it became national park, while others had joined conservation groups and lobbied to bring about just that situation. The collections and associated documentation resulting from these projects allow these different perspectives to be explored.

Local newspapers and radio stations were used to publicise the projects and the consultants also approached some of the important clubs that women were involved in during this period, such as the Melbourne Women Walkers Club and the Hobart Walking Club. They identified networks of women who knew one another through such contexts and the interviews they conducted help to relate the recreational activities of these women to other aspects of their lives.

Recycling and green consumerism

World Environment Day, which falls on the 5th of June, was instigated following a United Nations Conference on the Human Environment held in Stockholm in 1972, amid concerns about environmental pollution becoming a global problem. It has since become a focus for publicity about environmental issues. For World Environment Day in 1991, the Commonwealth Government sent out an education kit to Australian schools which had as its theme 'No Excuse - Lets Reduce'. Sue Read, the teacher at Woomargama Public School asked her students to prepare posters to represent this theme and tied in the making of these posters with her lessons in environmental education. The posters are now in the Museum's collection. To document them, I visited Woomargama Public School and spoke with the teacher and her ten pupils about their posters. I recorded each child explaining what his or her poster meant. Many relate to sorting rubbish into separate bins. However Woomargama rubbish tip has no sorting facilities and there is no organised collection of plastic, glass or paper for recycling.



Figure 3 Boy holding poster at Woomargama School, near Holbrook, New South Wales.
Photo: Ruth Lane

The messages passed on to children are often confusing. On the one hand they are confronted with the message that they should consume less and on the other, with a plethora of advertising images persuading them to buy more and more consumable products. One girl had pasted pictures of a sewing machine, a vacuum cleaner and a computer on her poster. She explained that these were all things that people should avoid using because they use up power. Instead, people should sew by hand, sweep the floor with a broom and use manual record systems rather than computers!

Despite the contradictions apparent in the term, 'green consumerism' is becoming a significant feature of Australian society and is having a growing impact in the commercial sphere. People do shop selectively for products that they think will be less harmful to the environment, both in their manufacture and their use, and for products that are either made from recycled materials or that are able to be recycled. However the issues attached to green consumerism are complex. Responsibility has been levelled at consumers, industry and governments, and debates revolve around the roles which these respective groups should play.

In 1990, K-Mart donated a collection of products marketed under its 'K Green' label. By collecting in this area now, it should be possible to document how the emphasis of green consumerism changes over time. In the 1950s the theme of hygiene emerged as a new way of marketing domestic products. Advertising seemed designed to tug at the conscience of the housewife who was charged with the awesome responsibility for a hygienic safe household. There seem to be many parallels with the way green products are advertised today and they too seem to target the conscience of the housewife.

Shopping has changed in many ways over the years and some of the items in the Museum's social history collection can help to document the way it used to be done. A commercial delivery tricycle, for example, belongs to an era when much shopping was done by home deliveries. There are examples of storage jars that foodstuffs such as coffee, flour and sugar which were bought in bulk were transferred into. Many people today are reluctant to buy goods in unnecessary packaging and are buying in bulk once again. Examples of biscuit tins and flour bags which were reused around the home for many different purposes demonstrate that there is nothing new about recycling. Ordinary objects that are part of our everyday life can be used in a museum to relate mundane aspects of our lives to environmental issues. Doing the shopping, with a little lateral thinking, is an important aspect of interacting with the environment. In fifty to one hundred years' time, the 'green products' of the 1990s and their associated advertising material will help people to understand some of the dilemmas of the 1990s. Doubtless people in the future will have a very different outlook and will interpret the objects and issues quite differently to the ways suggested here.

During 1992, the Museum employed a consultant to conduct a project aimed at documenting the material culture of backyards which are where most Australians have had their first contact with the natural world and as such, they play an important role in shaping environmental perceptions. As adults, our attitudes towards the environment have in turn shaped the kind of back yards that we create. There have been offers of material for the back yards project from all over the country and when the Museum opens, one display might consist of recreations of backyards from different eras. Each will say something about the people who made it and allow the Museum visitor to consider the significance of the different environmental perceptions that shaped the respective backyards.

Nature study in schools

Schools in Australia began to include nature study in their curriculum from the beginning of the century. Environmental education is now one of the fastest growing areas of study in schools, and children today tend to be much 'greener' than their parents. The first collections in this area happened as a result of a recent emphasis at the Museum in documenting the lives of women in Australia.

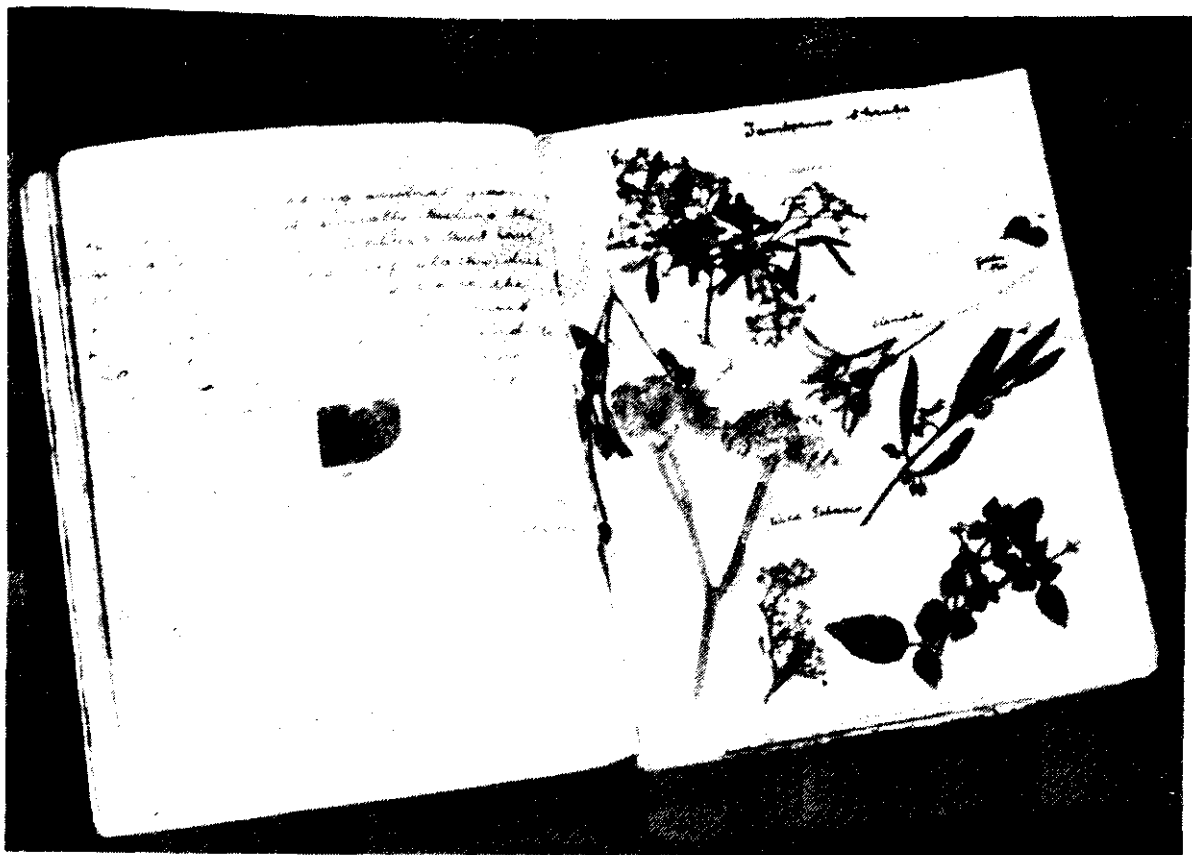


Figure 4 Nature study note book prepared by Mrs Coulter at the Teachers Training College in Brisbane, 1933-34. Photo: National Museum of Australia

In response to a leaflet asking for donations of objects relating to women's working lives, Mrs Coulter donated a nature study notebook which she prepared while studying at the Teachers' Training College in Turbot Street, Brisbane, from 1933 to 1934. After graduating she used this notebook to teach nature study lessons in Queensland Primary Schools. The notes were based on the curriculum for nature study sent out by the Education Department and Mrs Coulter copied them from the blackboard. She also copied the drawings from charts prepared by the lecturer and pressed flowers and pasted them in on instructions.

'Nature Knowledge' became part of the syllabus for Queensland state schools in 1904. Mrs Coulter says in a letter to the National Museum that:

Books on such subjects were simply unavailable in those days except at a highly technical level of no use to the average primary teacher who at that stage had usually had about 2½ years of high school. For instance I had studied English, French, Geography, History, Arithmetic, Algebra (no Geometry a real hardship when I

did Matriculation at night) bookkeeping, typing and shorthand.
At no time did I study any science of any kind.

Between the 1890s and the 1990s, nature study was introduced as a curriculum subject in public primary schools throughout Australia. Wattle Day and Bird Day were introduced into New South Wales schools in 1910 and 1911. At that time the most popular Australian writer in the Commonwealth school exam paper was Henry Kendall who wrote mostly about nature in Australia.

Dr Winnifred Curtis, a promising graduate of the University of London, migrated to Hobart in 1936. At first she was only able to obtain a part-time position at the University of Tasmania, and so took another part-time job teaching senior biology in a private girls' school in Hobart. It frustrated her that the only texts available used British flora and fauna as examples. Her response was to write a new text based on Australian flora and fauna - *Biology for Australian Students*. Until this text became available, Australian high school students had to make sense of local flora and fauna using British models. She is the author of the 6 vol *The Endemic Flora of Tasmania*, the *Student's Flora of Tasmania* and *Biology for Australian Students*. She was one of the first women on staff at the University of Tasmania, and the story of her career and anecdotes from her life form part of the documentation for a collection of equipment and photographs which she donated to the National Museum in 1992 as part of a new project aimed at documenting the lives of women scientists in Australia.

Transmission of traditional knowledge

Ian Abdulla is an Aboriginal man who lives at Barmera on the Murray River in South Australia. There is a long family history of association with this country and with the river. When he was a child, he lived with his parents along the river bank, and they trapped water rats and sold their skins for money. He retains some of the family's traditional knowledge about how to use plants and animals along the river for food and medicines. In 1988, Ian Abdulla attended an arts workshop held at the Aboriginal community centre at Glossop. Despite protesting that he could not draw, he began painting scenes from his childhood along the river.

I visited Ian Abdulla and his three children at Barmera in 1990 to document the paintings in the Museum's collection. We drove together to the various sites along the river that his paintings depict. As we drove he told his children some of the traditional names of plants and animals and pointed out the dead red gums that he had drawn from memory in his pictures. His paintings provide an important medium for passing on traditional knowledge to his children.



Figure 5 Ian Abdulla and his children, Tracy, Owen and Joseph, outside their home in Barmera, SA. Photo: Ruth Lane

Conclusion

This paper has drawn on a number of examples from the Museum's collection to demonstrate approaches to interpreting the theme of *People's Interaction with the Australian Environment*. The examples show how objects can be used to explore the diverse ways in which people interact with the environment, and the approaches outlined demonstrate the values of both a biographical and an issues-based focus to collecting activities.

Although the collecting projects outlined here have approached forest history in tangential ways, there is clearly a great deal more to do in this area. The interdisciplinary framework of the National Museum gives it the potential to build collections that will provide new source material for interpreting the many ways in which people have interacted with Australian forests.

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CHAPTER 18

ORAL FOREST HISTORY AND THE NATIONAL LIBRARY

Gregg Borschmann

Significant individual items of oral history folklore relating to Australia's forests are to be found in the archive of the Oral History Section of the National Library of Australia. However, generally very little of the material in the archive's 60,000 tapes relates directly to the social or oral history of the forests. Most of the items have been collected incidentally by folklorists mainly interested in traditional songs and dance tunes. The National Library's Oral History Section is the leading centre of its type in the country, but there is no national database of work completed or in progress on the oral history of Australia's forests and woodlands. 'The People's Forest' project which the National Library is supporting is the first systematic national oral history collection of Australia's forest and bush heritage.

The lot of the folklorist: It's not luck, it's digging

Alan Scott visited the Day Care Unit of the Murwillumbah Hospital on Thursday, 4 July, 1985. Scott, then 55 years old and a musician and folklorist, wasn't sure what the visit would produce. Although he had privately collected material in the 1950s, he was on his first official field trip to northern NSW on a grant from the National Library of Australia to record oral history folklore. He appeared to be out of luck. One of his two contacts in Murwillumbah was away on holidays. The other was in Brisbane attending a funeral.

Scott wanted to record older folk who knew the songs and played at the community entertainments and family get togethers in the days before music and dances became commercial, and the advent of radio. Feeling disappointed and a bit 'stuck' about missing his two potential interviews, Scott did what all good folklorists get used to doing - he started digging elsewhere. He had an appointment at the Tweed Historical Society's Museum lined up. He decided also to go to the Murwillumbah hospital. He knew Thursday was a good day to visit as single pensioners were bused in for a day of 'craft therapy'. It really was little more than a chance for often isolated folk in the community to get together, have a chat and receive a cheap meal (Scott 1992).

The folklorist sang and played a few songs then explained what he was looking for. He got talking to John William (Jack) Lange. Lange was 96 years old. He didn't know music and couldn't play an instrument. But Scott sensed his story was significant. In 1907 at Perch Creek in the Tweed River valley, Lange applied for a block of land to start a dairy farm. It was part of the 'Big Scrub' - rainforest country that once stretched from the Tweed to the Clarence Rivers which today is all but gone. At the time, Lange probably didn't consider his life or his story remarkable. But Scott knew it was. He wanted to record it, and asked Lange if he was going to be at the hospital the following Thursday. Lange replied: 'Well, I hope so'. He was. And Scott recorded 33 minutes of what he has since described as 'probably the best recording of that sort of thing I have done. It was so natural, it hardly needed editing' (Scott 1992). Lange's memories not only provide a unique first-hand oral insight into the clearing of the 'Big Scrub'. They reveal much about a life that was uncomplaining and self-reliant:

One day we was carrying the gear and I slipped and I was carrying a maul and two wedges, an axe and across-cut saw around me shoulders and I slipped and I run the tooth of the saw in there (indicates upperarm), and the blood spurted out, I must have hit a vein. Anyway there was a neighbour just come up on to the farm below and he bound it up and I went home and me mother when I got home she just put turpentine on it and bound it up and I went back to work again.

The Lange interview is now stored, catalogued and duplicated for public access at the Oral History Section of the National Library.

Like most material relating to forests, woodlands and the timber industry in the OHS, it ended up there almost incidentally as a result of other interests and activities by the folklorists and others who have contributed to the collection. The Alan Scott collection is a significant part of the archive. Yet of the 78 tapes recorded by Scott, only two of them substantially and directly relate to the forests or timber workers.

The origins of the Oral History Section archive

The Oral History Section, formally created as a Special Collection or sub-section of the National Library's Australian Collections in 1985, was initially modelled on the Columbia University Oral History project. Its original purpose was to supplement the collections of personal papers held in the Library's Manuscript Section. The section has about 60,000 tapes in its collection. Approximately 15,000 are current affairs recordings of mainly ABC news and current affairs programs. The remainder of the collection, about 45,000 tapes, are oral histories.

The core of the Library's oral history holdings are interviews with distinguished Australians. The careers represented are varied but the collection has developed strengths in the areas of federal politics, government and administration, literature, music, theatre, art and business. This interview program with eminent Australians remains a high priority (NLA undated). Much of the material from the 1950s to the early 1980s comes from the Hazel de Berg collection. De Berg started working independently in 1957 on a project recording Australian poets, writers and people involved with the arts. By the time of her death in 1984, she had recorded 1200 interviews with Australians from the likes of Sir William Dobell and Judith Wright to Dame Enid Lyons and Arthur Calwell. None relate directly to the forests or woodlands, but there are some remarkable poetic references to the Australian countryside and bush, including Dorothea Mackellar reciting 'My Country' and W.H. (Will) Ogilvie, recorded in 1963 when he was 93 years old, reading 16 of his poems including 'A leaf from the Macquarie', 'The Ninety flood'; and 'The Bush'.

Folklore and the Meredith Collection

The NLA has been interested in folklore - and as part of that oral history - since the mid-1950s. In 1955 (later Sir) Harold White, the National Librarian, wrote to John Meredith expressing interest in Meredith's new part-time hobby collecting traditional Australian songs. Meredith had started two years earlier with one very unsuccessful attempt at taking down longhand some old bush songs played by a retired shearer. Meredith decided that he needed a tape recorder. He sold his camera, bought the new machine, and so began the recording of folklore in Australia (Waters 1992). Meredith's early collecting was restricted by time and money to interviews in and around Sydney, the area immediately west of the Blue Mountains (especially Lithgow, Gulgong and Mudgee), the Upper Murray, Albury and Beechworth. His sources were mainly bush workers - shearers, farmers, miners, teamsters and men who had worked with timber, either cutting, carting, ringbarking or clearing.

Edwin Goodwin is a good example of the early Meredith material relating to forests. Goodwin, who was 73 year old when Meredith recorded him in 1955, was a timber cutter who had spent most of his life in the Nambucca River district of northern NSW. Meredith was introduced to Goodwin by a Dr. Ces English who had attended Goodwin while he was sick in hospital. The doctor had learnt the song 'Dennis O'Reilly' from Goodwin and suggested Meredith get in contact with him. According to Meredith papers lodged with the NLA:

When Goodwin ... had recovered from his illness, I wrote to him and several days afterward he called on me at Lewisham. We spent the afternoon recording songs and talking about the old times, but unfortunately, I did not have enough tape to record the reminiscences (Meredith undated).

Meredith collected 14 songs from Goodwin that afternoon. Most of them had a 'distinct Irish flavour' but unfortunately for forest historians, none of them related to the forests. How wonderful it would have been if Meredith could have recorded some of the social history of a timber man born in 1882. Goodwin would have had very clear memories of timber-getting late last century and early this century. He died several months after the Meredith interview.

The Goodwin story is typical of much of Meredith's other early collecting. He was after songs, dance tunes, yarns and recitations. Sometimes there was a short introduction or explanation. Some of the material incidentally related to forests, but there was no attempt to comprehensively record the stories or life histories of people with a background in the forests. 'I had to buy the tape and I couldn't afford to let it run away on mere words. The songs were more important to me' (Meredith 1992).

Unless you talk to Meredith directly, it is laborious to search this material collected in the 1950s for particular subjects - for example, references to forests. It has been catalogued by the library's Oral History Section, but is not on the Australian Bibliographic Network (ABN). This means that rare but classic material can easily be overlooked. For example, in the index of the Meredith material recorded prior to 1982, there is a single card reference to a song called 'Mazlim's Mill'. The card simply tells you it is sung by Jim Bourke and its on Reel 2A-5. But in the Meredith papers and transcripts, and in his 'Folk Songs of Australia' (Meredith 1967), you learn that Bourke had lived and worked in the North Queensland rainforests. Meredith only recorded two songs - one 'The Gun Canegetter' and the other 'Mazlim's Mill'. Fortunately, the tape was running as Bourke, who was then living in Sydney's Surry Hills, told Meredith: 'I was camped at Vine Creek, we were cutting timber for a feller named Mazlim - he was the mill owner there - and laying on the bunk, and it was raining and we couldn't get the timber in. This is the song that was composed':

Now I'm a bullock driver and I work for Mazlim's Mill,
And pulling timber from Vine Creek I've nearly had my fill.
And when the rain it comes at last, the roads they are like glue,
It's dig her out, or double bank, to find the balance due.

The cutters are no better off, at us they cannot grin,
For when they get their timber cut, they cannot get it in;
And my advice to you, my boys, please do not take it ill,
Far better turn your bullocks out, than work for Mazlim's Mill
(Meredith undated).

Bourke also explained on tape: 'It was near Ravenshoe that it was written. It was made up by Paddy McMahan. 'Double bank' means to yoke two teams of bullocks in tandem. 'The balance due' is that part of the contract money held back by the employer to ensure that the job is completed' (Meredith undated).

In 1963 the National Library bought the Meredith collection and placed it with the Hazel de Berg collection of recordings in a small oral history unit of the Manuscripts Section. Meredith had stopped collecting by then - he felt a bit alone and unsupported - and there was work to do editing the collection for his book with Hugh Anderson 'Folk Songs of Australia - and the Men and Women Who Sang Them' which was published four years later by Ure Smith. In 1962, National Librarian, Harold White, had commissioned a report on setting up an oral history section within the Library. This did not occur until 1984, although the library did appoint a specialist oral history officer in 1981. By coincidence, that same year Meredith was back in the field again. The library offered assistance by loaning a reel to reel tape recorder, providing tape and helping with Meredith's expenses (Waters 1992).

Meredith is still recording. With the Library's assistance through the 1980s and 1990s, he has been able to travel far more extensively, with field trips into Victoria, Tasmania, South Australia and West Australia. And although he is still principally seeking out musicians, the material collected contains far more conversation and oral history. A good example came during a field trip in September, 1991 to West Australia. Meredith was referred to an accordion player, Victor Starkie, at Pemberton. Starkie, born in 1915, spent much of his working life as a timberfaller, but Meredith did not know this until he got to his house. The walls were covered in photos of tall timber and forests which gave Meredith the hint and the first 30 minutes of the tape recorded Starkie's biographical details and stories of timber falling. He then recorded 21 songs, dances and waltzes. An indication of how his interest in folklore has broadened - and the fact that the library now supplies the tape - came on that same trip as he sought out ex-forester Tom Britten. Britten couldn't play music, but Meredith thought his reminiscences about forestry and especially how to regrow jarrah and karri were important and should be recorded (Meredith 1992).

Other Collections containing forest material

The O'Connor collection

As early as 1953 a team from the Folk Lore Society of Victoria was making folklore recordings that occasionally chanced upon forest related material. The core of the team consisted of Norm and Pat O'Connor, Maryjean Officer and Bob Michel. O'Connor generally did the recording and talking and Maryjean Officer compiled the notes. Like Meredith, their sources were generally bush workers - bullock drivers, shearers, farms hands and men who cut fence posts or cleared land. Like Meredith, O'Connor was inspired by and caught up with the folklore revival of the 1950s.

The 1950s saw a resurgence of interest in Australian art and culture ... I heard "Click Go the Shears" and the "Wild Colonial Boy" and wanted to buy some (Australian) records but none were available ... American popular culture was swamping the country, musicians were playing poor imitations of American pop songs. I was one of hundreds of people who said, "This is not good enough. We have got to have our own" ... the Folk Lore Society was formed by people mainly interested in writing. I started recording stuff I was interested in ... because no-one else was doing it' (O'Connor 1992).

Like Meredith, funds were limited, so field trips were generally only weekends away and there was little time for lengthy oral histories. Also like Meredith, they were principally interested in music folklore. But some songs and incidents relating to the forests did get recorded. For example, timber cutter Simon McDonald, born in 1907, was an early interview, recorded in 1953. He tells yarns and recites material but one of the few direct references to timber is when he recites his own poem 'Two Axe'.

The O'Connor Collection of 148 audio tapes and other material was purchased by the Library in 1987. It contains references to wood-cutting around Queenstown in Tasmania, memories of Beech Forest in Victoria, the opening of land for selection and subsequent timber cutting in NSW, and an interview with Alan Marshall who used to play the bullock bells! Much of the early material was collected in Central Victoria, including around Creswick. O'Connor cannot recall now any particular reference to timbercutting (O'Connor 1992) and, unfortunately, summaries of the material on the ABN catalogue system are not thorough enough to document specific references to forests or woodlands.

The Oral History Section has substantial collections by a younger generation of collectors, who are often also musicians themselves. Most notable include Chris Sullivan, Barry McDonald, and Warren Fahey.

The Fahey collection

The Fahey Collection of 78 tapes was recorded over 10 months during 1972-73 when Fahey travelled the eastern States looking for all aspects of folklore, traditional and contemporary. This included folk songs, folk dance, poetry, yarns, childrens games, riddles, work styles and personal reminiscences. The Fahey Collection is catalogued but not on the ABN system. Despite publication of an extensive report including transcripts of the field collecting program in 1974 by Fahey's Australian Folklore Unit (Fahey 1974), it is difficult to assess how much material directly relates to forests. Certainly there are some songs and occasional references. For example, Cyril Duncan, born in 1907, learnt most of

his songs from his father who was a bullock driver in the Nerang area. Fahey recorded 'Bullocky-O' which Duncan said was written by his father John Duncan:

I draw for Smecke's Mill, bullocky-O, bullocky-O,
And ther's (sic) many a log I drew, bullocky-O,
I draw cedar, beech and pine, and I never get on the wine;
I'm the king of bullock drivers, don't you know,
Bullocky-O, bullocky-O.

There's Guinea and Wapples to, bullocky-O, bullocky-O,
And it's many a log they drew, bullocky-O,
I can tell you it's no slander when I say I raise their dander,
When they hear the crack of me whip, bullocky-O, bullocky-O

There's Anderson and Cameron too, bullocky-O, bullocky-O,
And it's many a log they drew, bullocky-O.
I can give them a hundred feet, act square and never cheat,
I'm the king of bullock drivers, don't you know,
Bullocky-O, bullocky-O. (Fahey 1974).

The Sullivan collection

Chris Sullivan has also spoken to and recorded several members of the Duncan sawmilling family, including Sid Duncan, born in 1907, who recounts stories of working in the forests with his uncles, and Len Duncan. Sullivan has also recorded Dick Rummery, who was born in Casino in 1901 and has many memories of forest trips with his father, timber getting, bullock teams and the timber mill at Rappville.

The McDonald Collection

The National Library has recently acquired the Barry McDonald collection of 200 tapes. McDonald is a folklorist and musician who plays fiddle and accordion whose collecting work has concentrated on the New England region. 'I never went specifically after foresters ... (but) the forests permeated people's lives, the bush was part of their persona'. (McDonald 1992). The McDonald collection contains material often gathered over several recording sessions (to build a relationship of confidence, intimacy and trust) with several outstanding bushworkers, bullockies and fallers. McDonald, as with most other collectors working from the 1980s onwards, has been careful to not only record their music but also document their lives and lifestyles. Unfortunately, as with the Sullivan, Fahey and other collections, very little of this material is on the ABN catalogue. Access conditions to the material are still being finalised.

The Queensland Folk Federation collection

In the past 12 months, in addition to the McDonald collection, the Oral History Section has acquired the Queensland Folk Federation collection. According to folklorist Edgar Waters, '... this collection is rich in social history - stories about pioneers of white settlement, especially timber-getters, teamsters and farmers' (Waters 1992). Again, as with so much other material in the archive, this collection - which was stored under a house in Brisbane before Waters rescued it for the Library - has not been thoroughly catalogued or entered onto ABN system.

The Lowenstein collection

In late 1992, the Library acquired 100 tapes from the writer and folklorist Wendy Lowenstein. Some earlier Lowenstein material recorded in the 1960s came into the Oral History Section with the Norm O'Connor Collection. This more recent collection of 'songs, poems, yarns, dance tunes, reminiscences, beliefs, medical lore, idioms, crafts, games, children's play rhymes, superstitions, prejudices, industrial folklore and legend' (Lowenstein's description!) was collected in the main during 1969 on a round Australia trip. The collection is indexed and summarised in two photocopied and bound booklets and will no doubt contain references to clearing, fencing, ringbarking, teamsters and other forest activities.

The NSW Trades and Labour Council

In the mid-1980s, the New South Wales Trades and Labour Council conducted an extensive oral history project which recorded memories of trade unionists, officials and NSW Trades Hall figures. Joe Weir, a member of the Timber Workers' Union since 1922 and its long-serving secretary, recorded memories of the 1929 Timber Workers strike and his time as an organiser for the union on the North Coast of New South Wales:

... (when) I first went to Wauchope, there was two hundred (sleeper) cutters, used to supply Wauchope ... in NSW there would have been a couple of thousand cutters.

Question: 'Were any of them members?'

'No, they weren't; but I organised them fairly well on the north coast, they did come to the party, plus the fact that the Government had put out an edict that everyone that lined up would be members of the union, but it wasn't easy to make them as we are, they were Country Party voters. In fact, not viciously, they wanted to fight you, to try you out. I said to myself a couple

of times, 'Why did I ever leave Sydney to come to this? To handle this job I want to be heavyweight champion of Australia'. (NSW Trades and Labour Council 1986).

Earlier in his life, Weir had fought 57 fights as a professional boxer in and around Sydney while he worked as an orderman at a Sydney timberyard! There are several other references to the 1929 Timber Workers strike in the NSW Trades and Labour Council collection.

The Namadgi Oral History collection

The substantial Namadgi Oral History project for the Kosciusko Huts Association recorded by Matthew Higgins which is in the Oral History Section contains some references to forests and forestry in the region. This includes an extensive interview with retired forester and Professor of Botany at The Australian National University, Lindsay Pryor. Pryor was born in Moonta, Adelaide, in October 1915 and came to Canberra in 1934 to complete his studies at the then seven year old Australian Forestry School. During the Second World War, Pryor was acting forester for the Australian Capital Territory. Pryor has recorded some valuable memories of Charles Edward Lane Poole, who when Pryor first came to Canberra was head of the Australian Forestry School and Inspector General of the Forestry and Timber Bureau. Pryor also recounts his work with ACT forester Cyril Cole establishing some of the early pine plantations around Canberra, including those at Pierces Creek, Uriarra and trying to control erosion caused by rabbits.

Pryor recounts Lane Poole's passion for snow skiing and the leading role he assumed in the Canberra Alpine Club. Lane Poole helped supervise the taking of timber in the region for the building of several huts and chalets associated with the early ski enthusiasts. Pryor also recalls giving a lift home in January 1939 after a working bee on one of the ski runs to a very sunburnt Gough Whitlam! (Higgins 1990). Higgins also interviewed Lachlan Maxwell, born in 1918 and a cousin to author Stella Miles Franklin. Maxwell by the late 1930s was a forestry ranger, involved with a number of arboreta including Bluegum, Bendora and Stockyard. The final report by Higgins is thorough and well documented, but this collection also has not been entered on the ABN.

The NSW Bicentennial Oral History collection

As part of the Bicentennial celebrations, the NSW Bicentennial Council financed an oral history project which interviewed 200 men and women born before 1907, who lived in NSW between 1900 and 1930. The collection is well indexed, and does appear on the ABN, which helps searching for specific references to subjects like forests and timbergetting. Timberman Ray Blisset, born in 1908, talks of memories of forests around Berry and Cambewarra Mountain and

working with timber in the Annagrove District. He also recalls the 1929 Timber Workers strike. Alfred Irvine, born at Berry on the South Coast in 1915 describes local forests, mills, logging, logging equipment and bullock teams. Dorothy Johnstone, born in 1904, speaks briefly of her employment in a timber merchant's office in Sydney.

Foreman Crawford, born in 1891, grew up in the Richmond Rivers region when his father was still clearing the land for a dairy farm. He describes the methods his father used. He was asked if he enjoyed the rainforests when he was young:

Well, I don't know whether I thought much about enjoying it. It wasn't any novelty you see. It was a thing we were brought up with all the time. It was just a normal thing. It's only when these things begin to be a bit scarce and it reminds us of what we saw years ago that we appreciate it so much. No, I wouldn't say that it was such an enjoyment to us that the idea from most people at that time would have been, well, clear it, clear the scrub and have the nice grass paddocks or something. You see that there was rubbish growing up all the time, pests amongst, you know, where the trees were cleared a bit and the big trouble was these pests would get amongst the trees even if you wanted to leave these trees, they'd become a harbour for all kinds of bad weeds and rubbish and everything and so you would really have to clear more of these trees than you wanted to get rid of all this rubbish. Because they were harbouring it and making more seed and making it harder and getting into the scrub more and more.

Interviewer: What were the worst weeds?

Oh, I would say tobacco bushes, wild tobacco. And lantana. ... (and) cockspurs that grew in the scrub, the cockspurs were a thorny thing, they were a terrible nuisance because every little bit of root would come up and after a fire, there would be a big cockspur which was a vine growing way up in the trees, it became a shrub afterwards growing all over your paddocks. (NSW Bicentennial Oral History Collection 1988).

The Frawley collection

Unlike many of the other collectors to be found in the Oral History Section archive, Kevin Frawley (although he likes Irish music!) is not a musician. Frawley's study of 'The Maalan Group Settlement, North Queensland, 1954' was based on historical records and also extensive use of oral history recordings with 14 of the original selectors and the surviving wives of another three settlers to this area south of Millaa Millaa on the Atherton Tableland. The Maalan had

been a prolific timber producing area. As one of the last great government sponsored land settlement schemes, it provides 'an insight into the myths and realities of an ideal which formed a crucial part of Australian land use policy, and the shaping of the rural landscape' (Frawley 1987). Originals of the 27 cassette recordings Frawley conducted for the project are deposited with the Oral History Section. The work was published in 1987 as part of a monograph series by the Department of Geography, Australian Defence Force Academy.

Other references

Other references to timberwork and cutting pop up almost by chance in the various collections. For example, in the mid-1970s Neil Bennetts recorded a series of interviews with dozens of leading Australian sportsmen and women. Axeman Douglas Youd was recorded in January, 1976 at Golden Valley in Tasmania for this series.

An interview with an Aboriginal man from Lismore, NSW, Frank McQuilty, gives an insight into Aboriginal words and customs from the region, including several references to rainforests. Recorded in 1968 by Marjorie Oaks, the original of the tape is with the Richmond River Historical Society. A copy was received by the Oral History Section from the Australian Institute of Aboriginal Studies in October, 1990.

Conclusion

As most of the Oral History Section archive has not been entered on the ABN system, a thorough bibliography of forest related material held in the archive would require an extensive search through all notes on the old manual card system, as well as the almost impossible task of listening to thousands of hours of tape not summarised. This process could be speeded with the assistance of the individual collectors.

The material relating to forests and woodlands in the Oral History Section, while it contains significant individual items, contains obvious gaps, by both region and also by type of work with and attitude toward the forest. The existing Oral History Section archive on forests and woodlands has not come about from any planned or comprehensive collecting strategy. Substantial work has been done elsewhere in Australia - for example by Jenny Mills in West Australia, by Helen Hannah and Ian Watson in New South Wales - of which there is no record in the National Library, despite this section being the leading centre of its type in the country. There is no national data base of oral history work completed or in progress relating to forests and woodlands.

The People's Forest project which has the support of and is in association with the National Library will deliver in one systematic national oral history

collection a comprehensive and extensive overview of Australia's forests woodlands and our human use of and interactions with those environments. Materials from the project, including tapes, transcripts and notes, will be permanently and publicly available to Australians through the Oral History Section of the National Library. An edited version of the collection together with material already collected will be published as *The People's Forest* book in 1995 by publishers Simon and Schuster.

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APPENDIX

NATIONAL LIBRARY OF AUSTRALIA ORAL HISTORY COLLECTION

Recordings containing items relating to Australian Forests

John Meredith Collection

- Adams, Ray. Ray Adams sings. 1990. TRC 2590/DAT-09.
- Bond, George. George Bond Plays accordion and sings. 1982. December 22. TRC 2221 C-9.
- Burgess, Norman. Norman Burgess plays Hohner erica accordion and speaks of local history. 1985. November 18. TRC 2222 R-126,127.
- Collins, Fred. Interview with Fred Collins. 1983. February 24. TRC 2221 C-16.
- Creenaune, Frank. Frank Creenaune plays accordion and sings. 1983. April 24. TRC 2221 C-27.
- Davis, Len. Len Davis plays musical saw. 1985. December 11. TRC 2222 R-140.
- Ellis, Gordon. Gordon Ellis plays saw. 1991. TRC 2590/DAT-22.
- Geeves, Lance. Lance Geeves speaks of his family history, whaling and timber-getting in South East Tasmania. 1985. November 18. TRC 2222 R-125.
- Hill, Norm. Norm Hill plays piano accordion and saw. 1986. TRC 2222/R168-169.
- McLaughlin, Walter. Walter McLaughlin plays leaf and musical saw. 1984. October 3. TRC 2222 R-27.
- Morris, Arthur. Arthur Morris, Mrs Pink and Mrs Morris present an oral history of Thirlmere. 1982. January 18. TRC 2221 C-2.
- Yates, Joseph H. Joe Yates plays fiddle, sings and talks. 1983. TRC 2221/C31-34.
- Wren, Eb. Eb Wren sings. 1990. TRC 2590/DAT-04.
- Wunsch, Leo. Leo Wunsch and his wife Laura sing and recite. 1990. TRC 2590/DAT-03.

Norm O'Connor Collection

- Bellchambers, P.H. Mr Bellchambers sings folk songs and plays harmonica. 1957. June, 8. TRC 2539/080.
- Bond, George. George Bond plays accordion and sings. 1982. December 22. TRC 2221 C-9.
- Conway, Jim. Interview with Jim Conroy. 1961. TRC 2539/028.
- Hills, Oscar. Mr Oscar Hills talks. 1967. May 18. TRC 2539/096.
- Hughes, Mr. Mr Hughes sings and tells yarns. Between 1950 and 1969. TRC 2539/034.
- Marshall, Alan. Interview with Alan Marshall who spins yarns and plays bullock bells. 1963. November 29. TRC 2539/058.
- McDonald, Simon. Simon McDonald plays fiddle, sings, recites poems and describes dances. 1953. TRC 2539/080.
- Richards, Fred. Fred Richards tells stories and plays piano accordion. 1985. January 24. TRC 2222 R-63, R-64.

Alan Scott Collection

- Brooks, Arthur. Arthur Brooks plays accordion and mouth organ. 1985. July 15.
- Johnson, Alex. Alex Johnson talks about cutting timber. 1989. TRC 2581/4-5.
- Lange, John William. Conversation with John William (Jack) Lange. 1985. July 11. TRC 2004 Reel 3.
- Nash, Don. Don Nash plays button accordion, sings, recites and talks. 1989. TRC 2581/1-3.

Chris Sullivan Collection

- Duncan, Len. Len Duncan plays accordion and speaks of his family and accordion playing. 1987. March. TRC 2750/406-409.

Duncan, Sid. Sid Duncan. 1987. March 1. TRC 2750/397-399.

Rummery, Dick. Interview with Dick Rummery. 1986. December 12. TRC 2750/379-383.

New South Wales Bicentennial Oral History Collection

Blissett, Ray. Interview with Ray Blissett. 1988. March 2. TRC 2301 Int. 197.

Crawford, Foreman. Interview with Inge Rieba. 1987. July 12. TRC 2301 Int. 139.

Irvine, Alfred. Interview with Alfred Irvine. 1987. December 2. TRC 2301 Int. 172.

Johnstone, Dorothy. Interview with Dorothy Johnstone. 1987. June 12. TRC 2301 Int. 63.

Slockee, Isobel. Interview with Isobel Slockee. 1987. December 1. TRC 2301 Int. 168.

Labor Council of New South Wales Oral History Project

Hooke, Jack. Interview with Jack Hooke, former Federal Secretary of the Federated Moulders (Metals) Union of Australia. 1986. TRC 1948/10.

McConville Bill. Interview with Bill McConville, son of a former caretaker at the Trades Hall, Sydney. 1986. TRC 1948/16.

Weir, Joe. Interview with Joe Weir former member of the New South Wales Branch of the Australian Timber Workers' Union. 1986. TRC 1948/25.

Kevin Frawley Collection

The Maalan Group Settlement, North Queensland, 1954. Series of interviews with 14 of the original selectors and the surviving wives of another three who were deceased.

Interviews with Kevin Frawley 1979 and 1980. TRC 2738.

Barry McDonald Collection

The collection of 200 tapes is still being catalogued.

Wendy Lowenstein Collection

The collection of 100 tapes is still being catalogued.

The Queensland Folk Federation Collection

The collection is still being catalogued.

The Namadgi Oral History Collection

Pryor, Lindsay. Interview with Matthew Higgins. TRC 2572.

Maxwell, Lachlan. Interview with Matthew Higgins. TRC 2572.

Warren Fahey Collection

Duncan, Cyril. Interview with Warren Fahey 1974. TRC 321.

Other

Anderson, Olive. Interview with Olive Anderson. 1982. May 10. TRC 1873 Tape No. 59.

Bourchier, John William. Interview with John William Bourchier. 1989. August. TRC 4900/67.

Shirley McNaughton. Interview with District Forester Casino. 1985. August 13. TRC 2010 C/130.

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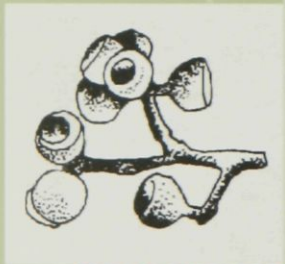


TO UNDERSTAND the present condition of Australia's forests, and to devise ways of meeting today's challenges for their use and management, we need an historical perspective.

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Felling a giant gum, Victoria
Illustrated Australian News, 1 March 1869
Courtesy of the National Library of Australia