

### Australia's Ever-changing Forests IV

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## Australia's Ever-changing Forests IV

Proceedings of the Fourth National Conference on Australian Forest History

**Edited by John Dargavel and Brenda Libbis** 

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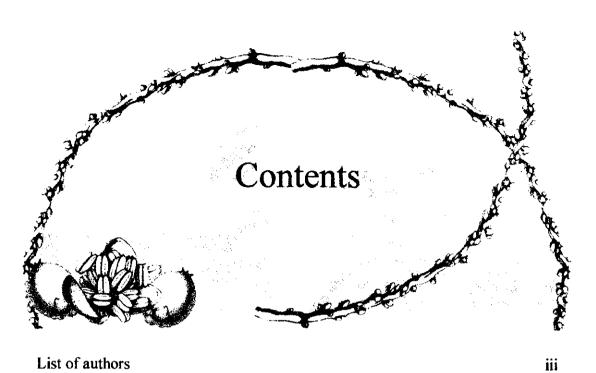
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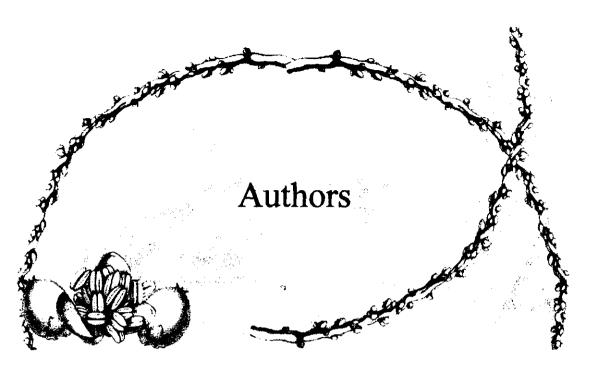
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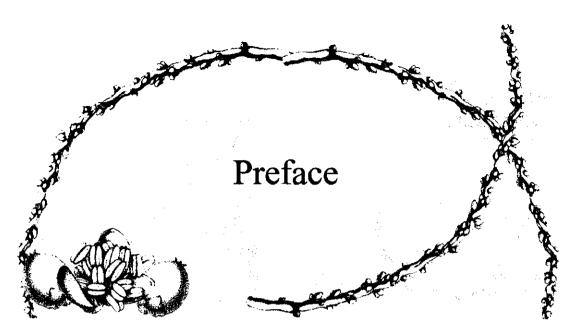
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Forest historians walk the tracks of many generations. We seek what the forests and woodlands meant to others, how they were affected and what changes they wrought. In such an ancient, varied continent we have much to do. We meet periodically to discuss our findings and we publish our work to share it more widely. The papers in this book were presented at the Fourth National Conference on Australia's Forest History on 19-22 April 1999. The conference was held in the country of the Gubbi Gubbi people at Gympie in Queensland. It included a study tour of the forests and plantations at Imbil and it was followed by a study tour in the country of the Badtjala people on Fraser Island. We were honoured that elders of these peoples joined us and deepened our understanding that the forests we saw were sites of massacre and loss as much as they were places of beauty, evidence of exploitation, or of restoration and productive endeavour. Forests have many-layered stories.

Forests have many images and many people. We have selected images of the piccabeen palm, Archontophoenix Cunninghamiana, to illustrate this book. One from the 1940s has a family in the forest, another was taken on Fraser Island to evoke the lush greens of that place, while those botanical images taken from Joseph Maiden's 1917 Forest flora of New South Wales display a pleasing harmony between science and art.

The stories have been grouped in this collection. First come five papers dealing with meaning. Eve Fesl's statement, which opened the conference, shows the forests as sites of dispossession but with a meaning which has endured for Aboriginal people. Anitra Nelson surveys the economic meaning of East Gippsland forests precontact, and Tom Heinsohn deals with the sometimes conflicting meanings which have been ascribed to human influences and wild nature. Two papers follow dealing with the meaning of tree planting for nationalism and grief.

The next group of stories deals with conserving the forests mostly as resources. The first of these, by Sybil Jack, deals with the royal forests of England in the sixteenth and early seventeenth centuries. It reminds us not only of British antecedents of forest policies but of their vagaries—a matter echoed by Judy Powell later in the collection. Two of the papers focus on New Zealand and raise questions about the motives for conserving forests. A paper by Brett Stubbs raises similar questions for rainforest remnants in northern New South Wales

Various aspects of the history of the management of forests and the establishment of trees and plantations, for either wood production or amenity, is covered in the next group of papers. They are drawn from the Australian Capital Territory, Queensland, Victoria and Western Australia. Three of them focus on particular people: Kevin Frawley writes on Harold Swain, John Gray on Charles Weston, and Matthew Higgins on the residents of an isolated forestry settlement.

The next group tells five stories of industrial enterprises using the forests of Queensland, Tasmania, Victoria and the Solomon Islands. They are stories of rise, expansion and eventual demise when the forest resource was depleted or commercial circumstances changed. Two papers seek to reconstruct the lives of those who worked in the industry. Peter Davies does so through an archeological study of an isolated sawmilling settlement deep in forests of the Otway Ranges, while Peter MacFie was able to use oral history to study the more recent logging township of Maydena.

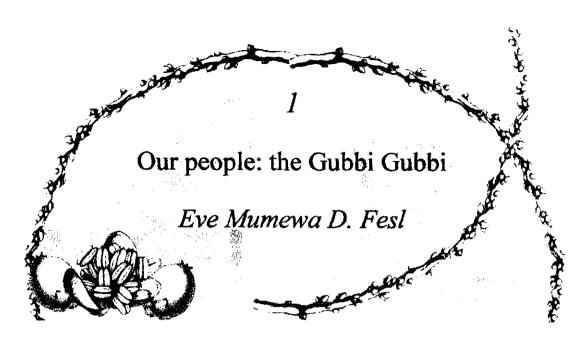
The last group of papers is concerned with how we reach our understanding of forest history. The first of these, by Marie Keatley, describes how she was able to analyse the seasonal patterns of eucalypt flowering thanks to the preservation of a long run of field record books kept by forestry staff. Three papers then describe the assessment of various aspects of forest heritage. Denise Gaughwin shows how the early arboreta and species trials in Tasmania are important to the forest record, while Juliet Ramsay and Jane Lennon address the difficulties of assessing aesthetic value. Finally, Stephen Legg challenges us to consider writing forest history with a postmodern understanding.

John Dargavel and Brenda Libbis Canherra



# Meaning





#### Our symbols

The Glasshouse Mountains are our sacred mountains. The fruit of the bunya pine has always played a significant part in our festivals. We live near the sea and in the mountains.

#### Our name

Our name means in English 'the people who say gubbi for no'. The phonological system of our language contains consonants which do not occur in English. One of these is a sound between 'k' and 'g'. Not knowing how to write this sound, some writers have written it as 'k', others as 'g'. They also used the letter 'a' to represent the sound as in the first 'a' in 'again' or the 'u' sound as in 'cub'. This has resulted in our name being written as 'Kabi Kabi', which results in incorrect pronunciation by those who do not know. To avoid the confusion, we prefer to spell our name 'Gubbi Gubbi' as the sounds most resemble the sounds of our language.

#### Our land, our country

Our traditional land extends from the north bank of the Pine River (Redcliffe) to the Gregory River, north of Maryborough. It extends westward and runs along the Conondale Ranges, then south to Caboolture, through Kallangar, to the Pine River. It includes the offshore islands, except Fraser Island which is occupied by

#### Meaning

a group of the Gubbi Gubbi who left the mainland hundreds of years ago and now speak a different language. Our country was almost entirely covered with forests.

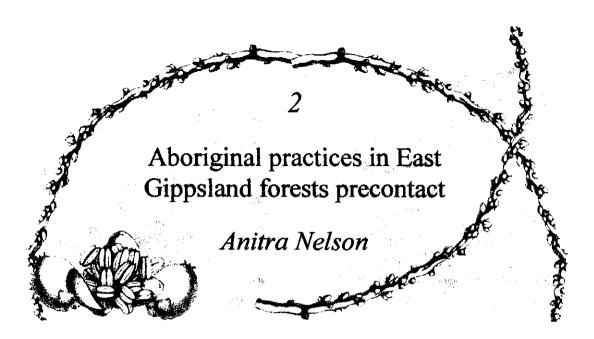
#### Our people and history

We have Elders in their seventies and eighties who have imparted our culture to us. Custodianship of land and the names of our group are traced through our mothers, that is the system is matrilineal. In the mid-nineteenth century the seizure of our lands began, many of our people dying through murder, by gunfire and poisoning. Those who survived were forced by government policies and police to points of incarceration known as 'missions', 'reserves' or 'settlements'. One of the largest was Barambah (now Cherbourg). Many Gubbi Gubbi, as well as people from other groups, were forced to live there and provided slave labour. Some of our Elders were children who were incarcerated in Cherbourg. As soon as they were allowed, most left the place which is on Wakka Wakka land, although a few people, particularly those who were born there, are there today.

Barambah was operated along the lines of one of today's prison farms, except that the 'inmates' were innocent people. Free movement in and out was denied and as soon as the children were old enough (nine years of age on), they were forced to do domestic or farm labouring work for neighbouring pastoralists and farmers. In the 1930s people were allowed to leave, but many had spent all of their lives there, had no money and their traditional land had been stolen in the interim. It has been a long and difficult road for those people without money to begin a new life—they were in effect refugees in their own land. Nevertheless, due to their tenacity and sacrifices, the Gubbi Gubbi are returning to our own country.

#### **Today**

Our grandmothers used to sit imprisoned in Cherbourg crying for our country. Our grandfathers too were saddened by being away from their country. But the time has come and our spiritual links are being rejuvenated—they were never lost—and our people are returning to our land to care for it, as this is the duty which our ancestors have bestowed upon us. We do this in a positive way with those who have moved here during our absence.



The Gunai appreciation of the forest ecosystem and their role in it was exquisitely subtle. The economy with which they subsisted in the East Gippsland forests and along the adjacent coastline was a result of cultural, material and physical adaptation. Perhaps 'adeptation' is a more adequate term, since, like Aborigines in other parts of Australia, they altered their landscape to make it better suited to their lifestyle as well as developing physical, social and intellectual skills that accommodated and maximised their use of local environmental resources. To be 'adept' is to be wholly versed in or very skilled at; the Indigenous peoples of Australia were not just first rate observers of their environment, they were also conscious participants in the development of their natural surrounds. The conventional term 'adaptation' emphasises accommodation to the environment (Kirk 1981). Alternatively, 'adeptation' emphasises that humans develop a knowledge of nature and adopt and transfer particular social and physical skills in order to alter as well as accommodate it according to their needs, as they perceive them.

The most significant principle of Indigenous practices was to honour the services provided by the forest ecosystem. In contrast, the white invaders, who were responsible for culling the Aboriginal population of Gippsland from about 3000 to 300 people in little over a decade in the mid-nineteenth century (Gardner 1993), introduced a capitalist social and economic system and a cavalier attitude to the possibilities of nature. In this paper I simply try to show the depth of the Gunai appreciation of their non-human natural environment by focussing on their use of and attitude towards trees.

Due to ease of access, both archeological and ethnographic research on precontact Aborigines concentrates on coastal areas rather than the inland forests. Most of the archeological sites have been analysed with aims related to their management rather than with their interpretive potential in mind (Cane 1990). Wooden remains perish quickly and easily except, say, in boggy areas (Flood 1995) though scarred trees, which are protected, are a peculiarly visible sign of past Aboriginal presence—Aboriginal Affairs is attempting to register all Victorian examples—and ground-edge stone axes testify to long existing wood work (Kuskie et al. 1995; Flood 1995).

Ethnohistorical accounts suffer from cultural, religious and gender bias which skewed the collection and analysis of data, and provide only fragments towards an holistic ecological perspective (Coutts 1981). The invisible knowledge and unrecorded skills of Aborigines is what is of most interest here and now; even though the economy of a highly mobile population limits use of implements to crucial ones, ethnohistorians and archaeological sources alike have emphasised the technology of visible commodity (Lewis 1992; Blainey 1982) rather than techniques or life style, of what I refer to as adeptation. It seems possible to identify plant and animal food sources of precontact Aborigines with some certainty (Pryor in Flood 1980; Hall 1990); Howitt (1996) mentions and Bulmer (1994) lists some basic foods. But, for all the other reasons given, the description here is necessarily very speculative.

The East Gippsland Forests is a zone artificially created for State purposes which extends east of the Tambo River and south of the state border to the coast. Precontact the area was inhabited from about 20,000 years ago by the Brabralung and Krauatungalung (both Gunai) and the neighbouring Bidawal, Ngarigo and a small number of Jaitmathang, whose boundaries stretched far into other areas. Only the Krauatungalung had extensive access to coastal resources and even they seem to have spent over half the year in wooded areas inland; the Brabralung and Bidawal had little access to the coast and the Ngarigo and Jaitmathang were landbound. For the latter this meant continuous migration for the extensive use of seasonally constrained forest resources, most often along river valleys or ridges. Howitt describes a natural larder so well stocked that he believed the Gunai peculiarly unlikely to feel the need to preserve or store food (Fison and Howitt 1991). While from coast to mountain the area was richly resourced, the average estimate of population density is about one person per ten square kilometres or a total of about 800 people (Flood 1980 in Cane 1990; Thompson 1985). Hall (1990) suggests that the extent and variety of food resources were fairly evenly distributed throughout the different landform and forest types; he refers to Geering and Gott who identified 155 edible plant species in their representative survey, half of which were root crops available all year.

Gunai had low level relations with neighbouring clans even though their cultures were distinct. The Gunai called the Ngarigo Brajerak or 'wild men' and Bidawal meant 'scrub dwellers'. The little we know of, and especially of the distinctions between, these groups (Thompson 1985; Hall 1990) is obscured in a general paper like this because the aim is to give a general picture of the way the Kooris in this area recognised, utilised and honoured the variety of forest resources they accessed and most of the sources refer to the Gunai. Apparently the inlanders were called Paiendra after Paien, a hatchet, by their Aboriginal

neighbours and Waddymen after Waddy, a tree, by the white settlers. Both terms point to the remarkable tree climbing skills of the forest people.

The temperate mountainous landscape of East Gippsland supported wet, dry and mixed sclerophyll forests interrupted by a few narrow coastal and high plains. The distribution and character of the tree cover in the mid nineteenth century—redgum, box, stringybark, mountain ash, and grey gum forests—is described by Douglas (1997). Hall (1990) identifies several characteristic species in the different sclerophyll forests covering 70-80 per cent of the area today: silvertop, white stringybark, saw banksia, mountain grey gum, shining gum, mountain ash, brown-barrel, blue gum, and messmate.

#### The tree, the structure

Just as the tree gives definition to the forest as an ecosystem, the tree gave content and form to the material and social structure of the Koori that inhabited the land-scape now known as East Gippsland Forests. Not only was wood the primary material for creating tools, fire, shelter, and transport but also the tree was a spiritual symbol that featured in the dreaming and rituals of the Gunai. So much so that the Gunai word for initiation ceremony, *Jeraeil*, meant 'leafy' or 'of the forest' (Howitt 1996).

A Gunai baby was placed in a wooden or bark cradle in the stick and grass shelter or bark and bough *mia-mia* of its family. A baby or child was referred to by at least one linguistic group in the area as *lid*, the same name as for ironbark. The breast the baby suckled from was known as *bag*, the name for milk and a knot in wood, or *nuja* or *ban* which also coincided with the names for bark in some regions. It is clear that the Gunai were part of the forest from birth and with the first word. In contrast, European insensitivity to the environment in the nine-teenth century is exemplified by E. M. Curr, who decided that because the Gunai words for 'milk' 'breast' and 'rain' are all the same, their mental organisation was deficient. Of course the rationality of this cluster is clear to anyone who makes a closer identification between humans and nature than the European, and in particular a male, ideology allowed; they are all nourishing. (Fesl 1985) The Gunai language itself made their association with nature, and particularly the forest, implicit.

In her general study of Gippsland languages, Fesl (1985) identifies other associations indicating the environmentally based culture of the Gunai. Various linguistic groups give similar names for: camp and Casuarina; camp and bark; throwing stick, yam-stick, hatchet and wood or tree; water containers and handles made from wattle bark; fire and wood (as well as light and wind); human skin and teeth and tree bark; canoes and red gum. The variety of different names for specific spears indicated their specialised purposes or specific sources. Trees not only had names that distinguished them botanically but also had different names depending on whether they squeaked, leant, were hollow, large, small or dry-dead. Probably associated with proximity when walking through bush, the word for leaf coincided with thigh, just as knee did with grass.

Place names that the Europeans later named after prominent men's surnames most often had direct associations with the forest for the Gunai. According to Pepper (1980), the Gunai word for Iguana Creek meant 'red gum', that for Merriman's Creek was 'an edible root', that for Mounts Taylor and Lookout (north of Bairnsdale) meant 'two spears'. The Aberfeldy River was referred to by the word for 'plenty of black possums' and Brodribb was 'place of gum trees', while Perry River meant 'climbing' and Straits River meant 'ti-trees'.

The Gunai child would learn that the particular word for edible roots Len was also used abstractly to mean 'good' (Fesl 1985). Although they were flesh eaters the Gunai lived mainly on plant foods. In this sense the digging stick was the vital instrument for a Gunai woman (she used it on men too). The daisy yam, prolific as if in fields in spring and summer, was a staple. Other plants collected by the women were the tomato like kangaroo apple, fern roots, bullrushes, sow-thistle and flag, tree fern stems, bracken, box gum roots, orchids, grass trees, lilies, certain berries or currants, nuts and fruits, like wild cherries. The bark, leaves, nectar, gum, tubers, roots, rhizomes and flowers of plants, especially herbs, provided medicines and adhesives. Gum was used to catch birds, for netting and to attach stone or bone barbs on wooden shafts (Ellis 1994). The sugar gum got its name from the white speck of sweet gum hidden under its bark. Hot ash from burned bark was rubbed onto sore areas of the body; eucalyptus leaf syrup was a common cure; boils or swollen parts were treated with a hot poultice of wild marshmallow or a lotion of wattle bark; and patients sat in a 'bath' of ashes (Pepper 1980). They used the pig face flower for salt to eat, say, with fish. The Gunai were a strong and healthy people who lived on a nutritious and varied diet.

Children were given dolls made from bark and would play a sport with a ball made from the skin of possums, just one of that species, of mammal, that exists in most variety in the forest ecosystem (Coutts et al. 1984). Fertile alluvial soils in valleys supported kangaroo, emu, possum, wombat, black wallaby, iguana and echidna (Feary 1988). They ate gliders, kangaroo rats, other small mammals and reptiles as well as numerous birds from swans to gulls and cockatoos (Thompson 1985). Besides eating the flesh, possum skins were used to make clothing, rugs, water containers and for decorative purposes (armlets and headbands), in creating musical instruments (a drum stretched between the legs) and balls for sport. Possum fat was frequently rubbed into the flesh to retain body heat and mixed with ash to treat wounds and jaws were hafted onto wooden handles to create tools for scraping and engraving. Similarly when kangaroo was eaten: its sinews became thread, cord and bands; the skin was made into clothing and to hold water; teeth became hair decorations; and the bone was used in making tools and for decoration. Emu feathers and eggs as well as their bones were also utilised variously (Coutts 1981). For the Gunai the forest was much more than timber.

Hunts were a male sport and gave them a particular connection with the forest (as expressed in the initiation ceremony). Individually, they were nimble tree climbers, cutting notches for their feet in the tough bark with a hatchet, that they held in their teeth as they sought possums, koalas, reptiles, grubs, honey, eggs of birds and insects. Bulmer (1994: 50) records that 'Gippslanders were the most

daring tree climbers, as they seemed to be quite at home on the top' and even at a 'very giddy height...they were perfectly cool'. Sometimes they created a stringy-bark sapling sling to hold their bodies against the tree trunk. Pepper (1980) describes how trees were used as subterfuge. A man would sit hidden in branches mimicking a water hen and could easily kill an investigating one with a spear or boomerang. The children playing below could then capture it. Blainey (1982: 130-1) points out that the Aboriginal 'hunters' instinctive and intellectual equipment was powerful; by understanding animals' habits, instincts and weak points they would trick and seduce them. The intelligence of the Gunai was translated into a European context later in the century when the mission children were outstanding students, gaining top marks in state examinations (Fison and Howitt 1991; Pepper 1980). Animal traps were made of bush and saplings. Their toes and bare feet were as nimble and multi-functional as our hands; with the hatchet, the tree dwellers' main tool, the forest dwellers would literally 'run up the tree after the possums' (Pepper 1980: 37).

What the Gunai made was in the image of nature; like Howitt's Aboriginal informant (Fison and Howitt 1991: 217), a Gunai child might have lifted her eyes to the sky to notice boomerangs travelling 'like a flock of parrots'. Certain wattle tree roots were used for making boomerangs (Pepper 1980). Non-returning boomerangs were used for hunting; returning ones were used to startle prey and in sporting competitions. Besides hardwood spears sharpened to a point and hardened by fire, the Gunai fashioned woomera, i.e. wooden spear-throwers, from softer woods. They had bark shields for stalking prey as well as for fighting, and wooden clubs. They made shovels from bark and wood too. Sticks were used for various purposes including to propel and steer canoes, by Gunai healers (Pepper 1985), as brushes for art work and as splints (Ellis 1994). According to Howitt (1996) a youth wishing to elope with a woman touched her with a long stick when she was at home alone and to consent she would tug the stick back.

Gunai children were taught adult arts (Pepper 1985) including a small tool technology that had existed for thousands of years precontact (Flood 1995). Aborigines gained bark by creating an outline on the tree trunk with a stone hatchet and prizing off the bark. The bark grows back only very slowly and scarred trees are a still a signal feature of Aboriginal sites in the East Gippsland forests (Wilkinson 1996; Kuskie et al. 1995). Bark was used to make canoes and paddles (after swan's feet), shields and boomerangs, containers, eating platters, fishing nets, for shelter and in burial, to dry out skins on (attached with wooden pegs), as well as for toys, sports and rituals (Coutts 1981). They pounded and hammered bark into shreds and rolled it into strips to make string for nets and dilly bags and to make snares out of twine and cord (Ellis 1994).

The Gunai made large, strong, relatively safe, tied-end bark canoes from the white stringbark eucalypt and mountain ash (Bulmer 1994). After levering the bark off the tree they trimmed the inner bark to make crimping easier when the canoe was shaped. They then heated the sheet and belted it with a hatchet to make it pliable. The smooth-faced canoe, made by turning the bark inside out, was an invention of the Gunai. The bark was tied with stringybark strands and stabilised

with thick stick ribs. Clay lined the base to make it water proof and to provide a base on which fires could be lit for warmth and torchlight fishing (Pepper 1980). The Gunai torchlight was made from long strips of candle-bark, stringy-bark bound to a long piece of wood that gave out light over a few meters and burned for a long period (Pepper 1980).

The Gunai child knew no other life than migration and since, as Blainey (1982: 202) points out, 'the land itself was their chapel...the migrations of aboriginals, though spurred by economic need, were also pilgrimages'. River valleys or ridges made good travelling routes. Stored food was burdensome as belongings and stored food, which the women carried, were burdensome and kept to a minimum. Like crows, from whom they'd adopted the sound *ngar* for 'yes', they moved from one set of trees and water place to another (Fesl 1985).

The family belonged to a close-knit band or food-gathering group loosely composed of several other extended families. People also belonged to clans (landowning groups) by descent. Clusters of associated clans formed cultural linguistic groups (tribes) such as the Brabralung. These in turn belonged to the defining cultural group, the Gunai. Each cluster developed distinctive and common customs regarding exclusive rights as well as the sharing of material resources and cooperation in both normal and exceptional circumstances. Ancephalous, but with clearly defined laws about roles and responsibilities, Gunai society imitated the model of the ecosystem that surrounded them; elders were like mature trees that protected and demanded the respect of youths. Their social roots stayed in the soil in which they were born, even as they were swept like seeds for reproductive purposes to another region. Rather than negotiable private property they had an infinite right and obligation to their traditional territory. Just as possessions were a burden, what they refrained from doing in the forest is as important as what they did. For them economy of time and maximising pleasure meant intelligently accessing and processing local materials in the most efficient way possible (Flannery 1994). They sought to gain a modest lifestyle with the minimum of effort and this they achieved more successfully than their contemporary in Europe, the peasant (Blainey 1982).

For those Aboriginal groups that had access to the coast, there were fish, shell-fish, and eels to catch with wooden spears, bone fish hooks and wattle-bark lines. Grass nets were held down by bark floats and stone sinkers. In the coastal Aurleun Valley, north of Gippsland, they used ti-tree and hickory leaves to make dammed fish narcotic, catching them as they floated to the surface (Flood 1980). Sometimes there were accidental finds like stranded whales. These discoveries offered the opportunity for gatherings; messengers were sent off with notched wooden message sticks to signal a collective feast. The Gunai left trails by planting a stick with a bark or leafy ball arrow pointing in the direction to take (Howitt 1996).

Seasonally, November to February, the Ngarigo congregated to collect and gorge on millions of bogong moths (Agrotis infusa) in the forests of the eastern highlands. Different groups attended these feasts as they engaged in ceremonies, exchange and marriage. The Gunai had access to the moth inhabiting Great

Dividing Range but there is no proof that they exploited them and less suggestion that they joined in collective activities (Flood 1980). This mainly male activity involved smoking the moth out of the rocks, catching them in shrub fibre nets or bark and then quickly roasting their sweet nutty meat. Those uneaten were ground with a wooden pestle in a wooden bowl or smoked and stored in a *coolamon*, a wooden container or hollowed out tree bend (Flood 1980).

Musical instruments were made from the tree whose live branches and leaves naturally sang in the wind: drum bases of curled bark; clapping yam sticks; and the hauntingly played reed (Flood 1980). In corroborees they attached branches to their legs as well as painting themselves (Pepper 1980). The Gunai painted on the inner walls of their bark shelters in ochres and charcoal (Coutts 1981). A charcoal mark on the debarked section of a tree can last for decades (Pepper 1980). Bulmer (1994) called the specially coloured and patterned possum skin rugs of the Gunai 'fine specimens of native workmanship'.

After contact money was referred to by the same, trade-linked, word for canoe or boat (Fesl 1985). Traditionally Gunai at least occasionally exchanged possum skins and wooden implements, like spears, shields, boomerangs and digging sticks with other groups for sentimental and utilitarian value (Flood 1980). However there is little evidence of extensive or intensive exchange and the Gunai did not benefit from the wide distribution of greenstone axes throughout the rest of Victoria (McBryde 1996; Flood 1995). Therefore their hatchets are even more likely to have been used simply in minor ways on trees, rather than to cut them down, as well as to fashion wooden tools (Flannery 1994). They had access to tough fine and course-grained rocks suitable for flaking and sharpening, namely quartz, chert, and silcrete (Hall 1990). The Gunai lived in an isolated area, which protected them from the early fatal diseases brought by whites, and it seems they were self-sufficient in the forest ecosystem.

After being encased in bark and set in a special hut for a funeral, a decomposing body might be carried along by their relatives until the remains were buried in the wooden hollow of a tree (Howitt 1996). Some were covered in bark and their graves edged with saplings; some were buried with their personal belongings, more often than not made from wood (Howitt 1996; Flood 1980). The Gunai died as they lived, people of the forest, of the trees. For all Aborigines trees had meanings and trees were conscious, just as the land had a being (Rose 1996) but for the people of the forest, the tree gave a special structure to their physical and social existence

#### Totems, initiation and dreaming

In *The Future Eaters*, Tim Flannery concludes that Aboriginal religious beliefs literally 'codified ecological wisdom' and summarised 'how best to utilise' the environment 'without destroying it' (1994: 284, 287). The totem is an individual's animal soulmate and provides an intimate spiritual bond with the natural environment. The Gunai had a special and rare system of moiety membership, through gender, which paralleled the relative equality between Gunai men and

women, who were both recognised and respected as elders, teachers and as hard labourers (Fison and Howitt 1991). The main totems were small birds; the men were Yerung and the women Djeetgang. Individuals also belonged to other animal totems; sometimes they were inherited in a patrilineal way, other times they were chosen, say, by a child's mother (Pepper 1985). Howitt describes certain tensions between men and women which involved them killing a real bird representing the opposite gender's totem to enrage them (Fison and Howitt 1991)

In an unusual demonstration of sentiment Howitt described a Gunai initiation ceremony as witnessed in a postcontact reconstruction and its affect on the participants whose traditional organisation was almost destroyed: 'the old tribal organisation arose again, so to say, out of the dust, and became active...' (Howitt 1996: 317-8). For the jeraeil (Fison and Howitt 1991; Bulmer 1994; Howitt 1996: Thompson 1985), the youths and young women were decorated with feathers and painted with duck eyes, koala ears and dingo tails. Tree products featured throughout the ceremony: women hit their yamsticks on the ground and the men used 'a long flat strip of thick bark' as a stick to keep time with, making hollow sounds on the ground. They twisted 'frayed stringybark in thick folds' over the upper part of the trunks of the charcoal-smeared initiates. The youths were made to lie on leafy boughs covering the earth and could make no noise except chirp like birds; at the end of the communal ritual their cousins, shaking branches noisily, took them from their mothers into the forest. With the threat of death if they revealed their newfound knowledge to any woman, they were introduced to the turndun, the secret male bullroarers made from the native cherry. The youths were instructed in the principles of Gunai social organisation: the authority of the elders; the philosophy of sharing and promoting social harmony; sexual morality and food rules. For fun, they also engaged in the 'possum game', the men holding stripped saplings for the initiates to climb as if possums.

Few Dreaming myths specifically of the Gunai are still known, but other Aboriginal myths feature symbolic trees, say, stretching like a ladder between the earth and sky (Mudrooroo 1994). The Gunai spiritual leaders (Birraarks) were said to traverse this distance to gain guidance from the Ancestors (ibid.: 148). They had supernatural experiences that Howitt (1996) refers to as séances, which involved active ghostly 'dead' called Mrarts. One such experience left a man, after 'whistling through the air', with 'a big log lying across his back'. Another story has the same disappearance through the night followed by voices 'in the tree-tops'. In yet another 'the Birraark was found in the top of an almost inaccessible tree, apparently asleep, where they said the Mrarts had left him when they went away.' Howitt (1996) also refers to a corroboree organised by a spiritual leader clapping two wooden weapon sticks. Gunai often received their powers through dreams; one who was left with a special stone, which apparently enabled him to kill people, describes the dream in which his father led him to a special place and instructed him about using magical items:

After that, he and the other old men carried me back to the camp, and put me on the top of a big tree...I woke up and found that I was lying along the limb...The old men came out with firesticks, and when they reached the

tree, I was down, and standing by it with the thing my father had given me in my hand...It was like glass...and they said that I was a doctor...I used to keep it in a bag made of the skin of a ring-tail opossum, in the hole of a tree...(Howitt 1996: 409)

Bulmer (1994) records both the story of the introduction of fire which involved it being stolen by the fire-tailed finch and the story of how the crow became black which also involved fire.

Howitt (1996) writes of ritual cursing involving the casuarina. In contrast, striking with a green branch is often intended to stimulate growth connected with the Dreaming (Rose 1996). The tree is sacred to all Aborigines, as testified by certain poems. For example, the Victorian activist, W. Les Russell (in Ellis 1994: 178) writes in *Red*:

Red is the colour of my blood; of the earth, of which I am part... of the blood of the tree of which I am part. For all things are a part of me, and I am part of them.

And the famous Aboriginal Kevin Gilbert (in Ellis 1994: 174) in Tree:

I am the tree
the lean hard hungry land...
I am all things created
I am you and
you are nothing
but through me the tree
you are...
and every sacred part aware
alive in true affinity.

#### A fabricated environment

The Gunai did not settle and reconstruct their environment like agriculturalists and industrialists but they did subtly fabricate their landscape, mainly by use of wood to create fire (Gell and Stuart 1989). Flannery (1994) suggests that the unreliable climate of extremes in most of Australia dictated adaptation through the creation of protective social customs rather than technological agricultural advances. Light cool burns optimised the land's productivity for humans, opening forests for both hunting and gathering, and improving biodiversity, since many Australian plants need fire to germinate or flower effectively (Rose 1996). Ash acted as a manure, which meant more plants, which meant more animals. Blainey (1982) describes the influence of Aboriginal fire management in detail. Grassy areas encouraged wild game and supported more edible plants. Fire contained rain

forest in open forest and made scrub land into grassland. Fire ash encouraged plants specifically tolerant or needy of its minerals and destroyed the undergrowth and various animal life. It is argued by some that over thousands of years the practices of Gunai, like those of Aborigines in other areas of Australia, encouraged fire resistant growth and controlled insects. Of course Flannery (1994) has refuted the connection between human influence and fire resistant growth. However, he adds evidence to the Aboriginal influence on their landscape, on flora and fauna, through fire practices.

Fire was created by wooden or grass fire sticks, by friction of wood against wood, and the primary fuel of bush fire for land management was grass, brushes and small trees. Fire was crucial for cooking, heating, cleaning, hunting, in warfare, in rituals, to heal, to deter insects, for torchlight fishing and socialising, and in creating tools and other materials, and in harvesting trees. The Gunai used a white fungus which grew on gum trees to sustain fire (Pepper 1980). Blainey (1982: 71-2) has referred to fire as 'the core' of Aboriginal technology and his stereotypical Aborigine has a blazing firestick always in hand. Similarly Flannery (1994: 217) calls fire 'the staff of life for the Aborigines'. It was sacred too; a special deterrent to spirits. If Howitt's records are correct then fires provided points from which one's social position in the camp was determined (Fison and Howitt 1991). Smoke, made by placing green branches on a fire, was used for signals. Smoking was a way to catch animals and to create atmosphere in rituals. When fires 'got away' Aborigines had techniques unknown to whites to harness their rage.

The Gunai had dingo pets, killed various species for food as well as affecting plant and animal life with what Jones (1967) has termed fire stick farming. Without human life, East Gippsland forests would have been a different ecosystem. Blainey's thesis attacks the view that Aboriginal society was passive towards its environment:

The idea of static population assumed a static environment and static natural resources. This assumption can no longer be held. It is incinerated by the firestick (Blainey 1982: 83).

Their migratory habits shifted seeds, roots and nuts to new regions. Controversy surrounds Aboriginal involvement in the extinction of the Tasmanian and mainland tigers and the giant marsupials (Flannery 1994; Blainey 1982; Flood 1995). Flannery argues that humans were responsible for the demise of megafauna, and not just in Australia. But this issue might be overshadowed in immediate importance by the 200 plus wild species that have become extinct since 1788 (Ellis 1994). It is also controversial whether Aboriginal toe holds and scars on trees precontact imposed 'considerable pressure' on eucalypt forests as Coutts suggests (Coutts 1981: 104; cf. Douglas 1997: 243). The precise influence of the Gunai on their landscape is in dispute (Seddon 1994).

#### Contact

The Gunai had always been an isolated, insular and even fearsome people. After contact the forest provided refuge to preserve some semblance of traditional life, and from which to conduct guerilla style attacks on the invaders (Gardner 1993). Mullet (in Gardner 1988) suggests that in 1860, when it was thought only a hundred or so remained, many more Gunai were still successfully living secretly in the forests (Pepper 1985). Certainly resistance to the invaders was strong. But they faced such formidable opposition during the 1840s that Henry Meyrick (1846, in Land Conservation Council 1992: 6) was forced to admit that: 'No wild beast of the forest was ever hunted down with such unsparing perseverance as they are.' Meanwhile those who were forced to accommodate white settlement naturally gravitated to forest activities. In East Gippsland the forest has remained the central focus of postcontact Indigenous history in both the nineteenth and twentieth centuries and, it seems (Cane 1990; Goulding 1993), more so than it does anywhere else in Australia.

#### Acknowledgements

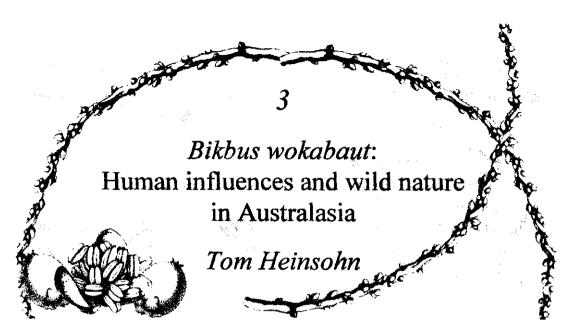
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Currently in Australia, words such as 'wild', 'nature' and 'wilderness' are caught up in ideological and disciplinary dialectics (Langton 1998; Griffiths 1996; Ross 1994; Flannery 1994; Mulvaney 1990; Taylor 1990). In recent years the pendulum has even swung from a position where ancient human influences on the environment were under-reported, to a virtual denial of nature. Thus a salient feature of recent discourses within the humanities dominated discipline of Environmental History, is a growing assumption that virtually every corner of the globe, other than the polar extremes, has been shaped by humans and is part of a managed human realm. Acclaimed works such as Bill McKibben's *The End of Nature* (1990), that warns of accelerated loss of the world's natural systems, has been pre-empted by some, who perhaps from a crowded European landscape, declare that 'wild nature' is a thing of the past. But is it? There are even those in a much less populated Australia, who after reading Flannery's ecological history postulations in *The Future Eaters* (1994), declare that every corner of the continent is an anthropogenic and managed environment. But is it?

Are socially constructed generalisations beginning to obscure environmental actuality? In an anthropocentric world, are we beginning to confuse degrees of human influence on ecosystems with wholesale creation? Are the remaining uncleared ecosystems of Australia that are still predominantly comprised of ancient native Gondwanan, Asia-Pacific and cosmopolitan species, not the product of a partnership between nature and varying degrees of human influence? When we say that human influenced landscapes in parts of the Australian bush are 'man-made', are we not forgetting the profound influence of nature as manifest in pre-existing biota, soils, topography, hydrology and climate? Are we verging on anthropo-narcissism and neo-creationism in some of our environmental history language?

The central thesis presented here, is that, although attenuated, wild nature and areas that adhere to biophysical definitions of 'wilderness' (i.e. nature-dominated landscapes) do persist in our region. Furthermore, it is argued that Indigenous cultural landscapes incorporate a range of conditions from highly anthropogenic environments to nature-dominated areas such as 'climax' forests. Contrary to socially constructed false oppositions, that have seen biophysical descriptors such as 'natural' and 'wilderness' misinterpreted, misrepresented and falsely vilified as synonyms for terra nullius, it is asserted here, that there is no contradiction between recognising nature and recognising Indigenous cultural landscapes. They are both integral and complimentary parts of the one landscape. Recognition of natural qualities in the landscape should not in any way negate or be confused with statements about tenure.

This paper endeavours to decouple dialectic driven preconceptions from purer debates about the biophysical qualities of land by juxtaposing Australia (in the second part of the paper) with the more neutral foreign landmass of New Ireland (described next). Being wholly owned by its Indigenous inhabitants and relatively free of inter-racial land tenure politics, New Ireland serves as a dispassionate comparative vehicle with which to probe our biophysical understandings of Australian landscapes.

#### New Ireland: A Melanesian measuring stick

New Ireland is a large 300 kilometre long hockey stick-shaped Melanesian island lying to the north-east of New Guinea within the territorial waters of Papua New Guinea's Bismarck Archipelago. Apart from some small adjoining satellites, it has never been connected by a land-bridge to any other large islands or to the combined Pleistocene New Guinea-Australian land mass of Meganesia (also called Sahul). It is relatively young and oceanic, having risen out of the sea in the Late Tertiary and Pleistocene through a combination of volcanic and tectonic processes. Its climate is wet and fairly aseasonal and the vegetation is predominantly that of Papuasian rainforest, while its natural fauna is predominantly oceanic and New Guinean in flavour, though lacking in endemics due to its young geological age. Ancient humans appear to have first arrived in the Late Pleistocene at around 35,000 years ago. A subsequent strong cultural influence was the arrival of Austronesian speaking peoples within the last 4000 years. These influences have blended to produce the contemporary Melanesian population of the region (Spriggs 1997).

The traditional (and contemporary) Melanesian production system of New Ireland is centred around swidden agriculture, arboriculture and the harvesting of marine resources, although terrestrial hunting and foraging are a significant part of the economy. In many ways though, there is no clear boundary between agriculture and hunting and gathering. Rather, there is a continuum with regard to the way that wild and domesticated species are managed.

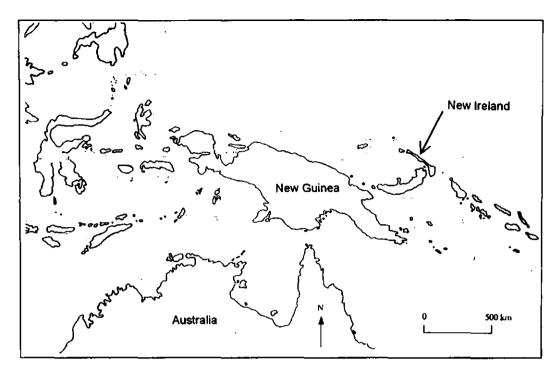


Figure 1. Map showing the relative locations of Australia, New Ireland and adjacent islands.

#### Swidden agriculture and introduced plants

The swidden agricultural system is dominated by Taro (Colocasia esculenta) in some areas and Sweet Potato (Ipomea batatas) in other areas; with other root crops such as Manihot (Manihot esculenta), the Greater Yam (Dioscorea alata) and Lesser Yam (Dioscorea esculenta), and starchy fruits such as Eumusan cooking banana (Eumusa paradisa) varieties serving as further significant staples. All of the above staples were probably introduced in prehistoric times from Southeast Asia, with the exception of Sweet Potato and Manihot which originated in the Americas and probably only arrived in the region relatively recently. Other supplementary crops such as Breadfruit (Artocarpus communis), varieties of the erect Australimusa bananas (Australimusa sp.) and cultivated Sugar Cane (Saccharum officinarum) are probably introduced from their centres of domestication in New Guinea-Northern Melanesia (Spriggs 1997; Swadling 1981). In New Ireland, the swidden forest fallow period between crops may vary from a few years in densely populated narrow coastal strips to several decades in sparsely populated inland areas.

#### Arboriculture and introduced plants

Associated with village areas and the near-coastal disturbed forests of the intensive swidden zone, is an esoteric secondary production system that may be invisible to the untrained eye. This consists of an arboriculture system that utilises both wild self-sown and transplanted domesticated or wild, nut, fruit and other useful trees. This system works by protecting favoured wild-sown trees and

planting others to produce a highly anthropogenic and useful secondary forest. Further from villages, it may superficially resemble jungle regrowth or indeed grade into jungle via wide zones of attenuation. Some of the traditional mainstays of this system include: Coconut Palm (Cocos nucifera), Sago Palm (Metroxylon sagu), Breadfruit (Artocarpus communis), Polynesian Chestnut (Inocarpus fagifer), Galip (Canarium indicum), Taun (Pometia pinnata), Cut Nut (Barringtonia spp.), Sea Almond (Terminalia catappa), Malay Apple (Syzygium malaccense), and Natu (Burkella obovata). A full list is given in the Appendix.



Figure 2: A Kara man near Lemakot in New Ireland processing sago by pounding the pith in the trunk of the Sago Palm.

In recent historical times the arboriculture zone has been penetrated by a number of new exotics that may now be found scattered throughout. Some salient examples include Pomelo (Citrus grandis) and Jackfruit (Artocarpus heterophyllus). Sago is a favoured arboriculture species in swampy areas or near

creeks. It is often wild sown, but may also be transplanted. After pounding the pith of the trunk (Figure 2), the pulp is processed with water to extract the palatable starch.

A number of prehistorically introduced arboriculture species, such as Galip and Breadfruit (probably both introduced from regional New Guinea and North Melanesian sources), have been dispersed beyond the arboriculture zone by travelling humans or birds and fruitbats, and can now be regarded as a naturalised part of the flora. However, though common in coastal areas, such obvious naturalised species were seldom encountered in the primary forests of the island's deep montane interior (Pers. obs. 1990).



Figure 3: Tigak youths in New Ireland with their catch of rabbit-sized Common Cuscus, a type of tropical possum. This game species was probably introduced circa 20,000 years ago from sources in New Britain or New Guinea.

#### Introduced animals, 'game park' strategies and domesticates

New Ireland has an extraordinarily long history in relation to introduced animal species. This has been reconstructed through the extensive excavations of the Lapita Homeland Archaeological Project (Spriggs 1997), Australian Museum collecting expeditions (Flannery 1995; Flannery and White 1991), and the ecological and oral historical surveys of the author (Heinsohn 1997, 1998a, 1998b). Faunal translocation started with the introduction of the Northern Common Cuscus (Phalanger orientalis), a type of tropical possum, by ancient seafarers approximately 20,000 years ago during the last ice age. Valued as a meat and fur animal, this rabbit-sized marsupial may have been deliberately introduced from sources in New Britain or New Guinea as part of a 'game-park' strategy in order to add a new resource to an oceanic island that was lacking in game. This was followed by the introduction of the Northern Pademelon wallaby (Thylogale browni) approximately 7,000 years ago, from sources in New Guinea or New Britain, probably for similar reasons (Flannery and White 1991; Spriggs 1997). Then in a continuation of an ancient tradition, the 1930s or 1940s saw the introduction of a third marsupial, the Common Spotted Cuscus (Spilocuscus maculatus). In this instance, however, oral historical records indicate that introduction may have occurred with the aid of Europeans or occupying Japanese forces who are believed to have used patrol vessels to transport animals from sources in the neighbouring St. Matthias Group (where it had been prehistorically introduced from sources in New Guinea) (Heinsohn 1997 1998a 1998b). Thus New Ireland now has 3 very natural looking New Guinean marsupials that are in fact introduced species. The two cuscuses continue to be released on small satellite islands and islets for later harvest, as part of an ongoing game-park strategy, and today this may even involve transport in aircraft (Heinsohn 1998b). One probable impact of cuscus introduction in New Ireland is increased browsing pressure on forests that once lacked mammalian folivores.

The second half of the Holocene or last few thousand years saw the arrival in New Ireland of some commensal rodents including the Large Spiny Rat (Rattus praetor) and the Pacific Rat (Rattus exulans), probably via ancient human watercraft. This same period also saw the arrival in New Ireland of the domesticated triumvirate of dogs, pigs, and chickens (Spriggs 1997; Flannery and White 1991; Heinsohn 1998b). Recent historical times have also seen the arrival of other shipboard or agricultural commensals such as the Ship Rat (Rattus rattus), Norway Rat (Rattus norvegicus) and the Brahmin Blind Snake (Ramphotyphlops bramina); while the Cane Toad (Bufo marinus) was introduced by Australians in 1939 to control insect pests, and the edible Giant African Snail (Achatina fulica) by Japanese forces as an emergency war-time food source (Heinsohn 1998b).

One known faunal extinction is that of the pre-existing Sanila's Rat (Rattus sanila), which appears to have occurred in the latter part of the Holocene following the arrival of the introduced Large Spiny Rat (Rattus praetor) (Flannery 1995; Flannery and White 1991).



Figure 4. Anthropogenic grassland in north-west New Ireland, probably produced by frequent burning.

#### Fire

Fire is an integral part of the swidden or slash and burn agricultural system. After clearing a patch of forest that has been in fallow, the slash will be allowed to dry in the sun and then burned. On more heavily populated parts of the coastal plain some modest kunai savannas dominated by *Imperata* and *Themedia* grass have formed (Reynolds 1972) which are most certainly due to very regular burning and some may be thousands of years old. These may have originated as smaller swidden clearings on poorer soils that were gradually expanded through repeated encroachment by agricultural fires that pushed back the forest.

Although wet tropical rainforest generally does not carry fire, perhaps once or twice a century a rare prolonged El Nino induced drought will allow sufficient drying for bushfires to occur. Such an event transpired in New Ireland about 1914, and was recorded by Government anthropologist E.P.W. Chinnery using stories collected from his New Ireland informants (1929: 45):

Dry spells from time to time produce food shortages, but as a rule these are apparently not very serious. In 1914 (?), however, no rain fell for about a year (?), and the people were in great distress. The whole country [New Ireland] suffered from drought, and excepting from the sago swamps, there was practically no food procurable. The period of drought and famine culminated in a series of destructive bushfires along the whole line of coast, bush and mountain ranges.

This has a poignant resonance with the recent 1997-98 drought that so severely affected both Papua New Guinea and Indonesia. It is, however, a vary rare event

for the almost constantly moist tropical rainforests of a relatively aseasonal New Ireland to burn. Thus, for New Ireland, it can be concluded that anthropogenic fire is of very local rather than broadscale significance in relation to the island's vegetation.

#### Sea to summit culture-nature continuum

On the basis of the aforementioned evidence of introduced plants and animals, anthropogenic arboriculture forests and the impacts of swidden agriculture, it would be tempting to generalise and describe the whole of New Ireland as an artefact shaped by human agency. However, excluding the broadscale influences of the commercial logging juggernaut of recent decades, as recorded in Barnett (1990) and Heinsohn (1998b), what proportion of this largely rainforest-covered island is strongly affected by traditional human influences? The answer can be provided by a seashore to summit transect near Taron village in far south-east New Ireland, that was walked by the author in 1990, prior to the recent logging of the lowland forest zone. This walk took in a transect that started on the beach and finished at about 2000 metres near the summit of Mt. Yengil, New Ireland's highest mountain.

At the start of the transect near Taron village, one was in a highly anthropogenic mosaic of arboriculture trees, regrowth and swidden gardens. The influences of swidden agriculture and attenuated arboriculture continued for several kilometres inland, until one reached the steep lower slopes of the Mt. Yengil massif of the Hans Meyer Range. Here signs of human habitation and salient human influences began to fade as a mosaic of secondary and primary lowland rainforest began to give way to what appeared to be mostly primary forest. This continued up to about 800-1000 metres where primary lowland rainforest started to give way to a more fern-rich primary lower montane rainforest. By about 1400 metres this lower montane rainforest became well-defined and rich in mosses, lichens and ferns, prior to a transition into a stunted fern-rich mossy elfin forest on the ridge tops at about 2000 metres. Looking west from the ridgeline at this altitude all that one could see was many kilometres of steep, rugged, and densely forested mountains that stretched for about 30 kilometres prior to descending to the narrow plain of the west coast. Apart from some reported small swidden and hunting hamlets that had penetrated along the deeper river valleys, most of this interior mountain area was uninhabited and very much dominated by the forces of nature. In the lowland rainforest and lower montane rainforest zones that cloaked the Yengil massif, the relatively pristine nature of these rugged ranges was confirmed by the presence of many ancient trees with breast height diameters of about 2 metres—some larger, while species searches detected virtually no introduced plants. Here was wild nature in all its splendour.

While it is true that much of the interior of New Ireland, particularly in the narrower central and northern sectors, had been depopulated following German colonisation, when village based labour was concentrated on the coast for the copra industry, there is little evidence that places such as the steep Yengil massif, being not particularly suited to human subsistence, were ever significantly inhabited. It was a little-used back paddock that was only occasionally traversed for

hunting or ceremonial purposes. In the landscapes of New Ireland, I had discovered an almost perfect continuum between culture-dominated areas at one end of the spectrum and truly nature-dominated areas at the other extreme. Furthermore, this perfect continuum made a mockery of the simplistic binary oppositions of 'cultural' versus 'natural' as constructed in sterile bipolar debates that fail to see shades of grey and duality of state.

#### Some salient Neo-Melanesian environmental terms

During my travels in New Ireland, these nature-dominated deep jungle areas were referred to by local people as 'bikbus' (a Pidgin term meaning 'big bush'), whereas the shorter disturbed regrowth forests of the swidden and arboriculture zone were referred to as 'liklik bus' (meaning 'little bush'). Indeed, to my surprise, some formally educated New Irelanders with a mastery of English used the word 'wilderness' interchangeably with 'bikbus'. A common warning was "Don't go there, its nothing but wilderness". And of course the term was used merely as a physical descriptor of certain qualities of wildness and remoteness, it said nothing of tenure, because virtually every square centimetre of New Ireland, apart from some areas acquired by government, church missions or businesses, were owned by one clan or another. Here the words bikbus and wilderness were innocent biophysical descriptors that did not carry any perceptual connotations of legal terra nullius.

In other parts of Papua New Guinea, such as in New Britain and on the New Guinea mainland, there are some very large virtually uninhabited bikbus areas. These may lack clearly defined boundaries of tenure and as a result may be prone to inter-clan land disputes, stimulated by imminent resource development.

#### Uses of bikbus areas in New Ireland

So what use are these barely occupied bikbus areas? They are the bases for populations of game species, such as wild pigs and pademelon wallabies, which extend into forests nearer to settlements. They are used for occasional longer hunting and gathering forays. They may be used as initiation sites and some are 'ples tumbuna' or sacred places that are the realm of spirits and ancestors. They are also like a little-visited back paddock that's left in deep fallow for hard times, in that they provide an emergency food source when crops fail. Indeed, during the big Papua New Guinea drought of 1997-98 that particularly affected the New Guinea mainland, it wasn't just the rice carrying Australian helicopters, or cash economy that saved the bulk of people from starving, but the forests (secondary and primary) that harbour all sorts of emergency foods including: tubers; fruits; seeds; nuts; edible rhizomes, leaves, shoots and stems; fungi; insects; and a variety of game animals.

# Australia: a land of burning oppositions

What are the salient features of Australia? Unlike New Ireland, it is massive and continental rather than oceanic, and was once joined to New Guinea to form the

combined Pleistocene landmass of Meganesia (or Sahul). It is characterised by poor soils and low relief and has a very variable climate that is due partly to the El Nino-Southern Oscillation phenomenon and partly to poorly understood internal variability. The driest inhabited continent on earth, it is dominated by flammable scleromorph vegetation and both natural and anthropogenic fire, and was probably occupied by ancient humans circa 60,000 years ago (Thorne et al. 1999; Flannery 1994). It has long been noted that it wasn't just the sea or isolation or Aboriginal people that kept the Austronesians and Papuans out during the Holocene, but probably the land itself (Mulvaney 1975) with its poor soils and variable climate that did not favour their swidden based agricultural systems.

### Indigenous production systems

The two great forces of ancient human influence in Australia are anthropogenic fire and hunting and gathering. In precontact times, the Aboriginal people of Australia were predominantly hunter-gatherers who had learned to manipulate the environment with fire. Indeed the hunt-gather strategy has been recognised as an appropriate one for Australia's extremely variable climate. It was a survival strategy that rather than putting all of the eggs in one agricultural basket, instead chose to opportunistically utilise a range of resources (Flannery 1994). Precontact Aboriginal Australia was a suite of cultures that was attuned to and perhaps determined by the recurring periods of stress that occurred as a result of the continent's extremely variable climate. Living directly off the wild flora and fauna of the land and sea, these were cultures that were in a profound partnership with nature. Today of course, most Aboriginal people are bicultural and part of a mixed economy and it may be offensive to stereotype this evolving culture as 'hunter-gatherers'.

# Introduced species

In prehistoric times there was only one introduced mammal, the Dingo (Canis lupus dingo), that was introduced circa 4000 years ago via Austronesian contacts with the northern coast (Corbett 1995); and only a few introduced plants including the Tamarind tree (Tamarindus indica) that was brought in by Macassans during the protohistoric period. Other possibly introduced plants (although there may be a few more yet to be recognised) include two of the Dioscorea spp. yams and possibly the Wild Gooseberry (Physalis minima) of Northern Australia, and the Potato Tree (Solanum erianthum) of coastal Queensland (Wace 1988). Indeed, pre-contact Australia stood out as one of the most biologically self-contained continents on earth.

#### Extinctions

One of the great questions regarding prehistoric human influences on Australia, is that of Pleistocene and Holocene extinctions. While there is general consensus that the Holocene extinction of the Thylacine (*Thylacinus cynocephalus*) and Tasmanian Devil (*Sarcophilus harrisii*) on the Australian mainland resulted from the introduction of the Dingo some 4000 years ago (Corbett 1995); there is considerable controversy regarding the role that ancient humans may have played

in the much more extensive Late Pleistocene extinctions of the megafauna. This Late Pleistocene extinction event included more than 85 per cent of terrestrial genera with a body mass exceeding 44 kilograms, most of which were marsupials, but also included other vertebrates such as the giant flightless bird Genyornis (Genyornis newtoni) (Miller et al. 1999). Positions within the debate range from Pleistocene extinctions being due mostly to climatic change and the drying of the continent (with some even questioning whether humans hunted megafauna at all); to extinctions being due to a combination of hunting and climatic change; or to being mostly due to humans (Kohen 1995). This latter position being the one promoted by Flannery (1994) in his Future Eaters hypothesis.

The author's own view is that it would be very unlikely for ancient huntergatherers not to hunt megafauna or to collect the eggs of giant birds such as Genyornis. Therefore, humans are likely to have had a significant initial impact on a naive fauna following first colonisation of the continent. This hypothesis appears to be well supported for the large flightless bird Genyornis, which being well dated, appears to have gone extinct shortly after the first arrival of humans and prior to the most dramatic climatic fluctuations of the terminal Pleistocene (Miller et al. 1999). Such a scenario may also hold true for some marsupial megafauna once dating uncertainties have been resolved (Flannery 1999). The most vulnerable species would have been the first to disappear, perhaps followed by others that became extinct at later dates as a result of a combination of climatic change and human impacts. Still other members of the megafauna such as emus, cassowaries and various kangaroo species are with us to this day, having survived the presence of humans. In other words, there is a range of scenarios regarding interactions between humans and megafauna.

In relation to plants, the recent finding of a tiny remnant of the fire-sensitive Wollemi Pine (Wollemia nobilis) begs the question to what degree has a combination of natural and anthropogenic fire brought about the local extinction of some fire-sensitive rainforest plants that barely survived the climatic bottle-neck of Late Pleistocene aridity?

In these debates, however, it is important to maintain a sense of proportionality, because nothing that Aboriginal people did over the last 60,000 years compares with the rate of change brought about by European settlers over the last 200 years. This latter impact includes: massive land clearance; broadscale pollution; salinisation; massive soil erosion; the widespread grazing of introduced hard-hoofed ungulates; hundreds of introduced noxious weeds; scores of introduced animals; an unknown number of introduced animal and plant pathogens; and the high extinction rate, particularly for mammals, that has characterised this period (Kennedy ed. 1990; Young 1996; Saunders et al. 1990). This is not to vilify anybody, but to acknowledge the ecological history upon which the modern Australian nation has been built.

#### Fire

Fire has long been used by Indigenous Australians for a variety of purposes, including: hunting drives; to create new growth or 'green pick' that attracts and concentrates herbivorous game; to encourage favoured plants; to clear the ground

for ease of movement, finding resources and stalking of game; to extend open habitats and edge environments favoured by humans and certain game species; and for signalling, warfare, ceremony and fun (Jones 1969; Pyne 1991). Furthermore, a proportion of Indigenous fires would have been accidental, having resulted from flare-ups of abandoned camp fires, fire-play by children or the escape of controlled burns.

While there is general consensus that ancient anthropogenic fire is very significant, there is considerable debate about the degree and ubiquity of impact on an Australian environment that had already co-evolved with ancient prehuman wildfires in a drying fire-prone continent, that would have had its own prehuman fire mosaic (Gill et al. 1981). At one end of the perceptual spectrum anthropogenic fire is treated as a ubiquitous force that has shaped virtually every corner of the Australian continent (Flannery 1994; Ryan et al. 1995), while a more modest assessment (Benson and Redpath 1997; Bowman 1998) sees heterogeneity, or a range of conditions in which anthropogenic fire affects some areas more than others due to concatenations of interacting variables. For precontact Aboriginal Australia, these include varying: human population densities and intensity of landuse across the continent; natural ignition regimes, such as those due to lightning frequency and timing; hydrology, soils and vegetation types; topography, including natural fire barriers; grazing by wildlife; seasonality of wet and dry periods; and longer term climatic change, such as the severe drying trend of the Late Pleistocene and the amelioration of the Holocene.

Perceptions of precontact Aboriginal fire regimes are also a little confused. On the one hand they are viewed as a great force that has scorched the vegetation into anthropogenic savannas and open woodlands, while on the other, they may be regarded as an ameliorating influence that due to repeated low-intensity fuelreduction burns, prevent the destructive high-intensity wildfires that destroy forest. Given the vulnerability of seedlings and plant recruitment to even lowintensity burns, and the different ways that controlled fires can be used, these views are not necessarily contradictory, but they do betray a divided mental attitude towards fire. There is also a degree of contradiction in the literature regarding the relative impacts of Aboriginal fires versus the later impacts of those ignited by graziers (Hancock 1972). Furthermore, the impacts of fire-suppression of recent times (aimed at short-term protection of property) have also muddied the debate by obscuring natural fire mosaics from study. Although many traditional regimes are quite exacting about when to burn so as to control the intensity and extent of fires, some obvious questions arise. To what degree would a natural unsuppressed fire mosaic in a high-lightning strike area have mimicked anthropogenic patch-burning? And to what degree were Aboriginal people able to control fires once deliberately (or accidentally) lit, or would the conditions on the day have been the primary determinants of outcome?

A further major problem in assessing the impact of Aboriginal fire, is the ambiguity of the evidence. The much touted pollen and carbonised particle evidence of G. Singh and A.Kershaw (as cited in Flannery 1994 and Kohen 1995), regarding very ancient supposedly anthropogenic fire, has recently been

assessed as by Bowman (1998) as ambiguous, circular and thus possibly due to climatically induced wildfires; while the historical evidence for extensive fire impacts as cited by Ryan et al. (1995) is also ambiguous and open to almost bipolar interpretations (Benson and Redpath 1997). Furthermore, the very presence of fire-sensitive vegetation or of non-fire-scarred vegetation at the time of first contact, or of contemporary non-fire-scarred or fire-sensitive old-growth forests that predate European colonisation, provides a conundrum that warns us against simplistic generalisations of ubiquitous anthropogenic fire impacts (Tulau 1996).

In common with Benson and Redpath (1997) and Bowman (1998), the author's own position in relation to anthropogenic fire, is one of accepting heterogeneity shaped by overlapping and interacting variables, and avoiding sweeping generalisations. After all, what is true in the savanna woodlands of Arnhem Land, may not be true in the heart of the damp temperate rainforests of south-west Tasmania. In relation to rainforests, however, there is little doubt that forest boundaries have probably been significantly pushed back by anthropogenic fire. This is particularly true in tropical Australia, where monsoon rainforests that naturally would have been more extensive have been pushed back to core areas and refuges by anthropogenic fire (Benson 1990). A good counter-example though is the wet temperate rainforests of Southwest Tasmania, which following the climatic amelioration at the end of the Pleistocene-start of the Holocene, appear to have spread out of refuges to occupy their current extent in spite of the earlier presence of Pleistocene humans and their fire sticks (Cosgrove et al. 1990; Allen ed. 1996). There are, after all, some types of vegetation that do not carry fire and in response to climate change may even expand to push back human influences.

One needs also to be wary of a parochial view that exaggerates the uniqueness of anthropogenic fire to Australia. After all, fire has been used the world over since prehistoric times and has its strongest presence in naturally fire-prone vegetation types and climatic zones (Stewart 1956; Pyne 1995; Russell 1997). Though a very important factor, the jury is still out regarding the relative significance of ancient anthropogenic fire in Australia.

## 'Wild nature' in Australia?

Do culture-nature continuums that include 'wild nature' or even areas that we could term biophysical 'wilderness' (nature-dominated areas) exist in Australia? Of course they do and along with the highly anthropogenic areas, all are a part of Indigenous cultural landscapes. The strongest example is provided by the inland areas of south-west Tasmania, that following the climatic amelioration at the end of the Pleistocene, were colonised by dense temperate rainforest, that all but excluded viable human occupation (Cosgrove et al. 1990; Allen 1996). This is perhaps the closest parallel to what Papua New Guineans refer to as a 'bikbus' area, and what westerners term 'wilderness' (a nature-dominated area). This is of course not to say that it was an unowned legal terra nullius, but rather, a little-used and little-influenced 'back paddock' for the surrounding Tasmanian Aboriginal tribes. Other nature-dominated landscapes within Indigenous realms may also be described for other parts of Australia. These vary in size and degree

of natural versus cultural influences, but continue to serve as important reserves of biodiversity, and quiet places of reflection for many Australians. Autonomous wild nature persists despite the magical thinking of changing human political and academic paradigms that would seek to wish it away.

#### Some salient Australian environmental terms

In recent years various negative spins, such as aspersions of racism, have been projected onto conservation terms such as 'wilderness'. However, to truly understand the semantics of such terms, it is necessary to look at the history of their evolution and use within Australian contexts. The Australian conservation movement which arose out of a coalition of concerned field naturalists, scientists. patriots, outdoor recreation enthusiasts and other nature-valuing members of late 19th and early 20th century society (Mosely 1988; Hutton and Connors 1999), was established in opposition to what Jock Marshall (1966) referred to as 'Anglo-Australian cupidity, wickedness and waste', not in opposition to Indigenous Australians. At its simplest 'wilderness' from the 1930s onwards was adopted as a contradistinction to the cleared, fragmented and industrialised landscapes that were beginning to dominate many areas (Dunphy and Thompson 1986). It has always been a relative rather than absolute term. Even expressions such as 'pristine' have a relativity to them, in that even a regrowth forest (that may be valued for its biodiversity) may seem relatively pristine when compared with degraded denuded land. Hence even this word is seldom meant in an absolute or literal sense when used in the language of conservation campaigns.

Misunderstandings of the term 'wilderness' have arisen out of ambiguities associated with literal readings of some basic dictionary definitions of this polysem (a word with multiple meanings). They have also arisen out of some misrepresentations and distortions of the term within ideological and disciplinary dialectics, some of which have drawn some long semantic bows and made sensationalist comparisons with legal terra nullius. For example, Griffiths (1990: 93) asks of wilderness, 'Is this terra nullius in another form?'. The problem is that once the seed of an idea has been sown, it may then lose its subtleties of nuance and rapidly evolve into a 'factoid', such as that 'wilderness' equals 'terra nullius', which then becomes incorporated into a new conventional wisdom.

Behind this belief is a constructed stereotype of the general public, outdoor recreation enthusiasts and conservationists as people who ignorantly see 'wilderness' areas as totally pristine and thus without human histories. For example, Ross (1994: 3), on the basis of supposition states: 'Ask anyone you know 'what is wilderness' and 90 per cent of responses will be along the lines of "a place where the hand of man has not set foot" [sic]'.

Such stereotypes have been manufactured without any ethnographic research into the intended meanings of terms as used by the people against whom the condescending assumptions of ignorance have been made. However, only a modicum of historical research into the archives of bushwalking clubs, for example, reveals that both Indigenous and European cultural heritage are salient themes within club activities as manifest in walking destinations and slide and lecture evenings. One classic example is a presentation entitled 'The Tasmanian

Aborigines' (evidence of their presence) by Jessie Luckman of the Hobart Walking Club, that appears on a 1962 edition of the club's social program (Hobart Walking Club 1962). Indeed many club members are repositories of information about cultural heritage sites and human impacts, and actively convey important information to park rangers, historians and archaeologists. This embedded cultural knowledge is reflected in The South West Book: A Tasmanian Wilderness (Gee and Fenton 1978) published by the Australian Conservation Foundation which is rich with chapters on south-west Tasmania's Indigenous and European cultural heritage. As with the Antiquarian imagination described by Griffiths (1996), it may even be a common practice to imagine people back into depopulated landscapes. This is manifest in bushwalker's searches for cultural traces such as stone tools, rock art sites, and old huts. Indeed, a whole range of popular works from James Fenimore Cooper's 1826 novel The Last of the Mohicans to the 1980s popular film Crocodile Dundee (as trite as they may be) have presented Indigenous peoples as an integral part of the nature-dominated landscapes that westerners term 'wilderness'. They present Indigenous people as a civilisation cloaked by nature. Equating 'wilderness' with terra nullius is simplistic and is easily refuted by deeper social and semantic investigation. It has long been realised that recognition of nature or wilderness qualities does not negate cultural heritage or degrees of human influence on the landscape. Indeed, as was demonstrated in Tasmania in the 1980s, in preserving wilderness areas we are also preserving Indigenous sites and cultural landscapes.

Finally, it must be added that conservation groups are on the same cultural sensitivity learning curve as the rest of the nation. In response to the ambiguities and ethnocentrism of the term 'wilderness', conservation groups have recently run a campaign demonstrating that areas termed 'wilderness' by Europeans are cultural landscapes for Indigenous peoples. There is a duality of state. This is manifest in a series of articles that clarify the complexities of 'wilderness' (for example, Hill and Figgis 1999), and also in the wide circulation within conservation journals of the Australian Heritage Commission pamphlet, Wilderness, we call it home. I would say, however, that there is still room in Australia for an innocent geographical term, such as the Melanesian word 'bikbus' that denotes qualities of wildness and nature-domination within parts of Indigenous realms. The world after all is not homogenous.

# Conclusion

The current tendency to deny nature in Australia is the by-product of a socially constructed false opposition. Recognition of Indigenous land tenure should not be dependent on the perceptual extinguishment of wild nature. Human society and nature have complexities that defy generalisation. If you look in the right places, they also blend seamlessly one into the other to form a perfect continuum. Rather than ask if it is racist to recognise the closeness of many Indigenous peoples to nature, should we not be asking if it is foolish for westerners, the industrial hunter-gatherers of fossil fuels, minerals, fish, forests and genes, on a rather small

climatically volatile planet, to see themselves as separate from it? Just as a supposedly omnipotent King Canute was unable to command the tide and waves, perhaps contemporary or future humans will be humbled by the autonomy of the Earth's great climatic engine—the ultimate expression of wild nature.

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# Appendix: Traditional arboriculture trees recorded in villages and near coastal disturbed forest in New Ireland

Species, common and local names with ethnobotanical notes

#### ANACARDIACEAE

Dracontomelon dao, Papuan Walnut/ Mon, 'Rah' in Kara . The fruit is barely eaten today. Was probably consumed more in prehistoric times. Now wild-sown.

Mangifera minor, Bush Mango, 'Kakui' in Kara. Fruit eaten. Was probably consumed more in prehistoric times. Now mostly wild-sown.

Spondias cytheria, Golden Apple, 'Urus' in Kara. The fruit is commonly eaten. Wild-sown and planted.

#### ARALIACEAE

Polyscias cumingiana, 'Vilui' in Kara. Leaves are eaten as a vegetable and wrap food for cooking. Grown as a hedge plant about villages, and wild-sown.

Polyscias scutellaria, 'Viliu-kafa' in Kara. Leaves are eaten as a vegetable and used to wrap food for cooking. Planted about villages.

#### BARRINGTONIACEAE

Barringtonia procera, Cut Nut/Pau, 'Falag-futun' in Kara. Kernel from its fruit is commonly eaten. Wild sown and planted. (PD: NG)

Barringtonia novae-hiberniae, Cut Nut/Pau, 'Palan' in Tigak. Kernel from its fruit is commonly eaten. Wild-sown and planted. (PD: NG)

#### Species, common and local names with ethnobotanical notes

#### BURSERACEAE

Canarium indicum, Galip, 'Pokoluluak' in Tigak. Nut is commonly eaten. Wild-sown and planted. (PD: NG)

#### COMBRETACEAE

Terminalia catappa, Sea Almond, 'Talis' in Kara. Nut is commonly eaten. Wild-sown and planted. (PD: SEA/NG)

#### CYCADACEAE

Cycas rumphii, Cycad, 'Nunui' in Kara. Seeds were probably eaten in the past, after processing to remove toxins. The fruits were also traditionally used to make 'humming nut' a type of musical instrument, while fruit resin and kernel scrapings were used to dress wounds (Peekel, 1984). Now mostly wild-sown but common.

#### **EBENACEAE**

Diospyros peekelii, 'Falagia' in Kara .The fruit is barely eaten today. Was probably consumed more in prehistoric times. Now mostly wild-sown.

#### **EUPHORBIACEAE**

Aluerites moluccana, Candle Nut. Nut is a source of flammable oil, and can be consumed after cooking. Wild-sown and transplanted. (PD: SEA/NG?)

#### FLACOURTIACEAE

Pangium edule, Sis, 'Sivu' in Kara .Fleshy part of fruit eaten. Seeds eaten after being leached to remove toxins. Bony seed coats were traditionally used to make dance rattles. Wild-sown and planted.

#### **GNETACEAE**

Gnetum gnemon, Tulip, 'Katap' in Kara. Fruit eaten raw or cooked. Leaves served as a vegetable and used to wrap food. Planted and wild-sown.

#### GRAMINAEA\*

Bambusa spp., Bamboo. Used in construction of artefacts and houses. Cultivated and wild-sown.

Dendrocalamus asper, Giant Bamboo. Used in construction of artefacts and houses. Cultivated and wild-sown. (PD: SEA?)

#### LEGUMINOSAE—CAESALPINOIDEAE

Intsia bijuga, Ironwood/Kwila, Kula' in Tigak. Hard wood is valued for construction and fuel. The beans are edible if processed to remove toxins. Wild but encouraged.

#### LEGUMINOSAE—PAPILIONOIDEAE

Inocarpus fagifer, Polynesian Chestnut/Aila, 'Kuop' in Tigak. Fruit/nut is commonly eaten after being roasted in a fire. Wild-sown and planted. (PD: NG)

#### LILIACEAE\*

Cordyline fruticosa, 'Si' in Kara. Used as living fence post and boundary marker. Planted and wild. (PD: NG)

#### **MORACEAE**

Artocarpus communis, Breadfruit, Vaia' in Kara. Fruit/syncarps and seeds are commonly eaten after being roasted. Timber used to make canoes and leaves to wrap food for ground ovens. Planted or wild-sown by fruitbats and birds. (PD: NG)

Ficus copiosa, 'Papus' in Tigak. Young leaves are eaten as a vegetable. Fruit is also eaten. Wild-sown and dispersed or transplanted by humans.

Parartocarpus venenosus, 'Livu' in Kara. Fruit/syncarps and seeds are eaten, the latter after leaching in sea water to remove toxins. Wild-sown and planted.

#### Species, common and local names with ethnobotanical notes

#### MUSACEAE\*

Eumusa spp., Asian Banana, 'Fut' in Kara, regarding a sweet variety. Many varieties. A staple with sweet fruited varieties often eaten raw and starchy varieties usually after cooking. Leaves used to wrap and serve food. Cultivated. (PD: SEA)

Australimusa spp., New Guinea Banana. Eaten after cooking. Leaves used to wrap and serve food. Cultivated. (PD: NG)

Heliconia bihai, Wild Banana. Fruit inedible. Leaves used to wrap and serve food. Mostly wild, but planted about villages for its leaves.

### **MYRTACEAE**

Syzygium malaccense, Malay Apple/Laulau, 'Kava' in Tigak. Fruit is commonly eaten. Planted and wild-sown. (PD: SEA?)

Syzygium aqueum, 'Easum' in Kara. Fruit is commonly eaten. Planted and wild-sown.

#### **PALMAE**

Cocos nucifera, Coconut Palm, 'Nik' in Tigak. Meat of mature nuts is eaten raw, or grated and made into coconut cream for adding to other foods. The sprouting stem and spongy material of germinating nuts is eaten raw, and the juice of young nuts provides a drink known as kulau. The tree also provides materials for artefacts and building. Planted and wild-sown. (PD: SEA/NG)

Areca catechu, Betel Nut Palm, 'Buai' in Tigak. Fruit is used as a stimulant narcotic, chewed with lime powder and pepper leaves. Planted and wild-sown. (PD: SEA)

Hydriastele kasesa, 'Kasi' in Kara. Yields wood for prongs of fish spears, fronds for mats and bark for construction. Wild-sown but encouraged.

#### **EUPHORBIACEAE**

Metroxylon sagu, Sago Palm, 'Sasak' in Kara. The starchy pith from the trunk is used to make sago, which is a staple in some areas. The fronds are used for thatch roofs and for making mats. Wild-sown and transplanted. (PD: NG)

#### PANDANACEA

Pandanus dubius, Screwpine, 'Faum' in Kara. Fruit segments and seeds are eaten. Leaves are used as a wrapping material and in thatch, while stilt roots are used to make tongs for handling hot stones. Wild-sown and planted.

Pandanus tectorius, Screwpine, 'Haran' in Tigak. Fruit segments and seeds are eaten.

Leaves woven into mats and rain hoods, and used in thatching. Wild-sown and planted.

Pandanus engelerianus, 'Vurume' in Kara. Juice is extracted from pulp of cooked seeds and mixed with other foods. Planted and wild-sown.

#### SAPINDACEAE

Pometia pinnata, Taun, 'Ton' in Tigak. Fruit is commonly eaten. Seeds sometimes eaten after leaching in seawater to remove toxins. Tigak use the leaves and leaf ash to make a poultice for boils and sores. Wood is favoured for construction. Planted and wild-sown. (PD: NG)

#### SAPOTACEAE

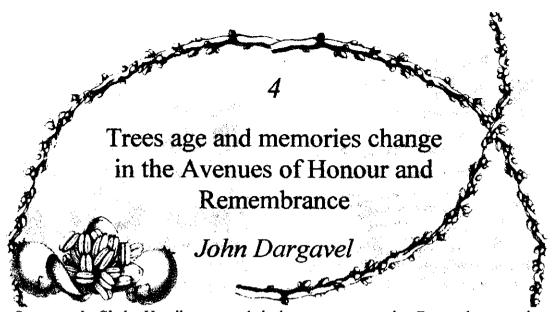
Burkella obovata, Natu, 'Natius' in Tigak. Fruit is eaten raw or cooked. Planted and wild-sown. (PD: NG)

#### **VERBENACEAE**

Premna integrifolia, 'Kong' in Tigak. Shade tree. Wild-sown but encouraged.

\* 'Tree' includes some non-woody species. ? = Unknown; NG = New Guinea region; PD = putative domestication; SEA = Southeast Asia; W = wild.

Sources: Heinsohn pers. obs. 1990; 1998b; Peekel 1984; Spriggs 1997.



Sergeant J. Slade Hamilton sounded the trumpet on the Burrumbeet road, opposite the Ballarat Golf Course, at 3 o'clock on the boisterous, wet, cold June afternoon of the King's Birthday in 1917. Six trumpeters echoed his call down the road and 500 young Ballarat women started planting the trees in a long avenue which honours 3,771 Ballarat men and nurses who went to the First World War. Twenty-five professional gardeners guided their hands and put in the stakes, and when the trumpets sounded again at 3.30, twenty-five professional carpenters attached name-plates to the stakes. 1 Miss Myrtle Quanchi was first in the lines of young women on either side of the road. She planted the fourth tree, an elm. Its plaque names Dan Weeks<sup>2</sup> who enlisted in the 8th Battalion of the Australian Imperial Force twelve days after the war had been declared. She planted an English maple five weeks later, this time for Norm Pinney<sup>3</sup> who had died at Villers-Bretonneux a year to the day before. And the next year, on 20th July 1918, she planted two purple elms side-by-side; one for her brother Robert Quanchi who had enlisted in the 8th Battalion with Norm Pinney, the other for George Buddle<sup>4</sup>. Was George his mate, a cousin, a friend even? What were her thoughts then? The 8th had been fighting on the Somme and we can imagine her fear for their lives; perhaps they were dead already? And how did she fear news of the Battalion's heavy losses that August? Robert returned safely and Myrtle came to marry another member of the Pinney family. We can wonder whether she mourned Norm as the long lines of trees grew each year into a shady avenue?

Planting the trees was a personal tribute for each of 'the Lucas Girls' as they called themselves—they all worked in a ladies' fashion factory—but planting a whole avenue along a main road out of the town was not only their collective act, it was a very public one. The Premier, Sir Alex Peacock, planted the first tree, Brigadier-General William the second; and Mrs Lucas, the third; though once these proprieties had been observed, station carried no weight. Trees were named

for soldiers by their date of enlistment, not rank, and it was only after the first thousand trees had been planted by the Lucas Girls that other local organisations, such as the Fire Brigade, the Post Office, the Racing Club and the Railway Workshops, planted short sections. The Avenue complete, the Girls raised £400 which employed a returned soldier to maintain it and another £2600 to build an Arch of Victory across the start. Although they had less opportunity for personal action in this, they helped cart the bricks and they made a pair of satin charmeuse pyjamas—embroidered with a coat of arms, the Arch, sprigs of wattle and three kookaburras on a eucalypt—which they presented to H.R.H. Prince of Wales when he opened it in 1921.

The Ballarat story, and those of the two hundred or more other avenues around the country can be read as another facet of the stories told by Australia's great war historians, such as C.E.W. Bean and Bill Gammage<sup>6</sup>, and particularly by Ken Inglis whose comprehensive history of war memorials, Sacred Places, is the essential authority. His focus on the over four thousand monuments erected after World War I establishes them as the basis from which subsequent studies of other aspects, such as this, must be developed.<sup>7</sup> The actions of Australian troops, their bravery and suffering, Empire loyalty, claiming a distinctive identity for the new nation, the Anzac legend, grieving those who lie in foreign fields, the high official language, memorials, their local essence, building State and national monuments, ceremonies of public mourning and remembrance on Anzac Day; all these themes run through the great histories.

But there are other histories. Most recently Joy Damousi tells of personal grieving rather than public action. She deals particularly with women's grieving, its patterns and expressions and of its subordination to the ascendant practices of Anzac Day. Her work encourages us to think that there are other histories yet to be written, perhaps of the men who did not go to war, or of building public halls, swimming pools and hospitals as memorials.

Several of the great themes run through the histories of avenues, but three are particular to them. First is personal action: individual people could plant the trees that could be named for individual men or women, sometimes their relatives. Such a personal connection was hardly possible when a committee engaged a mason or builder to erect a monument. Second is the sense of a future which attaches to planting a small tree; a monument has only a past. Third is the natural dynamic of the tree's life which, like all living things, must age and die. Old trees, as Strutt suggests, 'bear a touching resemblance, alike in their budding, their prime and their decay' to the 'destiny of man'. The ageing of the trees seems to parallel how memories of war change and how mourning eases with time and passes with the generations. Where monuments became, as Inglis calls them, Australia's 'sacred places', avenues were its domesticated ones. Where monuments remain and remind, fading avenues allow us to forget.

As with monuments, there is change too in the way avenues have marked wars from the victory avenue planted in Horsham for the South African War to the memorial avenue on the outskirts of Wodonga for the Vietnam War. The form of organisation, the degree of involvement by individuals or by the state, the species

of trees planted, the landscape design, the extent of identification of individuals with trees, the choice to recognise all who served or only those who died, and the use of plaques and signs all varied over time, as they did between places. Unlike monuments to which nothing happens between Anzac days (with odd exceptions for property developments, traffic re-arrangements and occasional vandalism). avenue trees grow steadily but are subject to droughts, storms, all manner of accidents, diseases, old age and the depredations of traffic engineers. Some are pruned by skilled aboriculturalists, others are brutalised by municipal engineers or electricity authorities. Some residents treasure their nearby trees, others demand their removal. Some places remember the origin of their avenues, others forget them. The contention of this paper is that the history of the avenues, and particularly what happens to them after they are planted, may be able to throw a further light on aspects of honour and remembrance in Australia. 10 However, the exploratory nature of this paper must be emphasised because there is no national survey of avenues, comparable to that for monuments, and I have only been able to visit a sample of them. 11

### Street trees and avenues

The avenues of honour and remembrance followed an established tradition of street planting and reflected a rising consciousness of trees and forests. Some colonial capitals and larger provincial cities, most of which had Botanic Gardens, had started planting avenues of trees by the 1870s in at least their better streets where kerbed footpaths or substantial tree guards could protect them from traffic and stock. Wealthy Ballarat may well have led. Granted land for a Botanic Garden in 1858, it planted a 'long avenue of trees' there in 1862. 12 A street planting programme was underway in the 1870s under the care of 'special staff'. By 1887 the Mayor could report that failed trees had been replanted and, 'the long avenues planted during the last decade now show to very great advantage'. 13 Trees were clearly valued but opinions differed sharply on whether or not the blue gums in the principal street should be replaced with oaks and grass.<sup>14</sup> In the end they were, so that by 1910 the Mayor could boast that Sturt Street 'is the finest and most attractive in the Commonwealth'. 15 The initial planting was almost complete as 'every main thoroughfare and cross street has its avenue of wellcared for trees'. The City's tree nursery also distributed some to the Botanic Gardens, schools and hospital grounds. Elms, maples, cypress and planes were the most favoured species, although some eucalypts and wattles were also planted.16

The Jubilee of Queen Victoria's sixty years on the throne in 1897 was celebrated widely and marked in many towns by naming Jubilee Avenues planted with trees. In Ballarat, enthusiasm for planting seems to have increased if anything during World War I. The avenue of honour on the Burrumbeet road was one of three honour plantings in the City; the Ballaarat [sic] North Progress Association planted an avenue in Beaufort Crescent and an arboretum was established at the Orphanage.<sup>17</sup> They were included in a planting scheme for the district placed

before the Minister of Forests by the Forward Ballaarat [sic] Committee. Seeking trees to be supplied from the State nurseries was felt to be 'something more virile, self-reliant and intelligent than merely dispatching a deputation seeking monetary assistance.<sup>18</sup> It seems they were successful as they started a plantation with 2000 pines, presumably supplied from the State nursery at Creswick.

# South African War, 1899-1902

A small marble plaque on the side wall of what is now the Dollicraft shop, where the Municipal Offices once stood, in Horsham in western Victoria marks one of the few—perhaps the only—avenue planted for the South African, or 'Boer' War. 19 It marks not loss or service, but victory. It reads:

Planted by the citizens of Horsham in commemoration of the success of the British and Australian troops in the South African War. December 1901

At least in the mind of Thomas Young, the wealthy former councillor who funded it, the avenue provided patriotic tutelage for future generations in the example of men who had 'risked their lives to fight for the Empire' in a 'righteous' war.<sup>20</sup> Its street, planted neatly with well-spaced elms, was re-named for Field Marshall Lord Roberts who commanded the British force, including the sixteen thousand Australians and contingents from New Zealand and Canada. The Australians had volunteered and been dispatched in what de Garis depicts as a 'tidal wave of patriotic fervour...to aid the motherland in her hour of need'. 21 Australia had celebrated when the long Boer siege of Mafeking was relieved in 1900 and in some places had planted trees to commemorate the event. Horsham's citizens were not just fervent, they were premature. Although Roberts had captured Pretoria in June, the Boers were not defeated, nor was peace declared until five months after the trees were planted. If few avenues were planted, about 100 monuments were erected to honour the six hundred Australians who lost their lives in the war. The losses were spread across many places. Horsham perhaps lost none. Two or three or four were common. Mooroopna, outside Shepparton, lost one then, but was to lose thirty in World War I.

Opposition to the war had always been significant and some Australian historians, such as Manning Clark and Stuart Macintyre, pay it considerable attention in themes of republicanism, radicalism and labour politics. Although the loyalists carried the day, their fervent adherence to Empire, right or wrong, was challenged during the final stages of the war when Kitchener's destruction of Boer homes, farms and crops and of herding women and children into 'murderous concentration camps' became known. But it was to be the Great War which erupted in 1914 that tested Australian attitudes to extreme in both trenches and ballot boxes.

# World War I, 1914-1918

#### **Ballarat**

The avenue of honour planted by the Lucas Girls on the Burrumbeet Road at Ballarat tells several stories. One is of their remarkable effort in raising funds, supporting a YMCA worker at the front, knitting 'comforts' for the men, farewelling contingents, raising money for wartime charities, planting the avenue which stretches for 22 kilometres out of the town and having the Arch of Victory built. Its cast includes strong, capable women like Mrs Lucas who built up the business and Mrs W.D. 'Tilly' Thompson, the sales manager, who was 'the driving force' involving the young women. In supporting roles were the Boy Scouts, high school students, gardeners, carpenters, various menfolk and local businesses.<sup>23</sup>

Another is the story told by the war historians, mentioned earlier, of Australian devotion to Empire and of the legend of Gallipoli where 219 of the 968 men in 8th Battalion died in the first week. The Battalion went on to France, to Belgium, to Pozièrs, Mouquet Farm, Broodseinde and Bullecourt. 'Impressing enemy and friends alike; it was in some ways the stoutest achievement of the Australian soldier in France', says C.E.W. Bean, but their confidence in the capacity of the British High Command was severely shaken. <sup>24</sup> While the Lucas Girls were planting trees in the rain, they were still fighting and dying at Passchendaele, Messines and the Somme. By the end of the war, 529 of Ballarat's volunteers had lost their lives and many more were casualties. <sup>25</sup> Its poignancy can be felt still. On name plaques dotted down the long avenue, small crosses mark those who never returned.

There is also a story which differs from that of the monuments. The Lucas Girls started planting their avenue—in what the *Ballarat Courier* called a 'patriotic Arbor Day'<sup>26</sup>—in June 1917, seventeen months before the war ended, and they continued it during that winter and the next. This was deliberate, not simply premature, as at Horsham. The outcome of the war was uncertain, fierce battles were being fought, the recruitment of fresh volunteers was not keeping pace with losses at the front, the conscription referendum in October 1916 had been narrowly lost and the second referendum in December 1917 followed suit. One returned officer, Colonel Hardy, thought that the avenue would have 'a cheering effect...upon the boys at the Front' and was proud of having a tree planted for himself.<sup>27</sup> That such recognition might aid recruitment was quickly taken up by the State Recruiting Committee who resolved in 1917 that every volunteer should be promised: 'that his name will be memorialised and perpetuated for all time' in the Avenue of Honour.<sup>28</sup> Perth asked the Ballarat Council for information and the idea spread to other States.<sup>29</sup>

These stories weave between the trees with various meanings to individuals that we cannot now unravel. Patriotism and pride we know, anxiety and grief we can imagine. Wyn Hunter, one of Lucas' staff, expressed it in a verse which ends:

Now in honour of each will we plant a tree
In order, as each proved a hero to be;
And what more fitting monument could we raise
Than noble trees, where lesser song-throated children will praise
The Lord God of Love? who maketh wars to cease.
Who will bring back our laddies in honorable peace.

### Nationally

A national survey of war memorials recorded that 131 avenues had been planted by the time it was conducted in 1920-21. Of these 92 had been planted in Victoria, 14 in New South Wales, 12 in Tasmania, 2 in Western Australia and 1 in South Australia. It provides only a general guide, as some were missed and others were planted later. Inglis' national survey of memorials did not cover avenues, although some are noted in passing. However, recent surveys have been conducted in Victoria and Western Australia that are discussed in the following sections. No comparable published surveys of other States have been located in the course of preparing this paper.

#### Victoria

Janine Haddow made a thorough survey of the Avenues of Honour in Victoria in 1987.<sup>30</sup> She found that 132 avenues were known to have been planted for World War I (four were extended and ten new ones planted for World War II). However, only 56 of the original World War I plantings remained at the time of her survey. The loss of avenues is discussed later in the paper.

A cluster of towns and smaller centres followed Ballarat's example. Fifty-two of them were in the goldfields-Central Highlands region, some in north-west Victoria, Gippsland and around Melbourne and a few in more distant places such as Horsham, Kaniva and Nathalia. Twenty of the 39 places for which Haddow records the date of planting did so in 1917 and 1918, before the end of the war. Dates are likely to be better known for the earlier plantings and it seems reasonable to assume that many of the plantings for which dates are not recorded occurred after the war when the earlier recruitment element had passed. Moreover, some of the later plantings, such as that at Traralgon, had trees only for those who died, rather than all who served, as at Ballarat. Judging from the number of trees planted, this appears to have been general. The smaller places only planted short avenues, many had less than 50 trees and Metung had only 6.

Individual action in planting avenue trees by groups of people, rather than local councils or state agencies, appears to have been general. For example, it was the school children who started planting the oaks and elms at Learmonth, near to Ballarat, in June 1917.<sup>31</sup> This is compatible with the school gardening movement discussed by Robin in Chapter 5 and is typical of plantings by groups like Men of the Trees or recently by Landcare.

No trees native to Victoria appear to have been planted. European and North American deciduous trees—the elms, oaks, planes, poplars and ashes (*Ulmus*, *Quercus*, *Platanus*, *Populus* and *Fraxinus* spp.)—which were already common street trees were chosen in most places. Monterey pines (*Pinus radiata*) and

Monterey cypresses (Cupressus macrocarpa) were planted in half a dozen places. Of Australian trees, red flowering gum (Eucalyptus ficifolia) from Western Australia, Moreton Bay fig (Ficus macrophylla) from Queensland and Kurrajong (Brachychitron populneus) from New South Wales were planted in half-a-dozen places. While symbolic meanings can be attached to species like oaks and elms, familiarity, reliability and ease of propagation appear as more likely reasons for selection. The 10-12 metre spacing standard for street trees was generally adopted so that, in the absence of signs or memory, there is nothing now to distinguish most Avenues of Honour from other avenues of the period.

#### Western Australia

Oline Richards surveyed Western Australian war memorials in 1996 for a commissioned inventory based on returns from local government authorities. It records eight Avenues of Honour planted for World War I (four of which were extended and a further one planted for World War II). None were planted before the war had ended and probably only two, at Albany and in Kings Park, Perth, had been started by the time of the national survey.

The avenues at Albany and Kings Park were started in 1919. Two years later, avenues were planted at Armadale and Collie. Planting continued in Kings Park until 1932. In 1934, 'relatives of the deceased' planted an avenue at Mosman Park. As in Victoria, species which were not native to the State were selected: oaks and planes in Kings Park, Norfolk Island pine (Araucaria heterophylla) at Mosman Park, camphor laurel (Cinnamomum camphora) at Collie and pines at Melville. The long-established State nursery at Hamel supplied a variety of trees to public institutions and probably supplied most of the avenues.

### Kings Park, Perth

Western Australia had chosen Kings Park, adjacent to Perth, as the site for a memorial after the South African War. After World War I, a State War Memorial and other monuments were placed there (and others subsequently) so that it took on the character of, as Inglis puts it, 'an open air pantheon to Western Australian heroes and heroines, civil and military'. 33 The State's first Avenue of Honour was developed in the Park to represent the State as a whole, unlike those elsewhere that represented local places.<sup>34</sup> The driving force was the redoubtable conscriptionist Arthur Lovekin (1859-1931), member of the Legislative Council, who owned and edited the Daily News. He was a member and, from 1919 to 1931, the 'benevolently autocratic' President of the Board which managed the Park. 35 With information about the Ballarat avenue to hand, he proposed the Avenue of Honour. It was distinguished from the start. May Drive was the chosen site. It had been opened by Princess Mary in 1901 and she, by then Queen, had sent Lovekin acorns from an oak (Quercus robur) growing in the Great Park at Windsor. Their seedlings were to be the first trees planted, augmented by others grown from the acoms of a tree in the grounds of the Bishop's House and sent by the Archbishop. Death is no respecter of such rank, nor was the ethos of the AIF, so that names were allocated to trees by lot which seems to have been the established practice in Victoria. It was the humble Private William Salter, killed in

action a year before, whose name is commemorated on the plaque of the first oak which was planted in heavy rain on the first Sunday in August 1919.<sup>36</sup>

Arthur Lovekin with power and prestige was no match for Tilly Thompson and the Lucas Girls. In Ballarat, 3771 trees were planted in two years, one for everyone from there who served. In Kings Park, 800 trees were planted in thirteen years for the 7000 from Western Australia who died. There were several reasons why the Kings Park avenue was developed slowly. May Drive itself had to be widened by felling the existing bush to make way for the avenue trees, and two other avenues had to be developed. Few of the first series of plantings of oaks and planes (*Platanus x acerifolia*) made in 1919 and during the 1920s did well and many had to be re-planted. In the 1930s red flowering gums (*Eucalyptus ficifolia*) from Western Australia and lemon scented gum (*E. citriodora*) from Queensland were used more successfully. At Ballarat, the Lucas Girls raised £2400 by holding dances, stalls and raffles to plant and maintain their avenue, and local businesses and people helped. In Perth, Arthur Lovekin and his family donated £1880, but relatives or other individuals were asked to sponsor individual trees at a cost of £4 each, reduced during the depression to £1.

### Other plantings

Avenues were only one of the forms of planting with which the war was marked. In many places, rose beds softened the stony monuments and trees shaded and framed them. Groves and parks were seen as fitting too. The Young Australia League planted 89 pencil pines in a terraced 'Grove to the Unforgotten' outside Armadale in Western Australia. Memorial parks are common in city and town alike, often with a formal archway being that place's monument and opening a path or avenue into a planted park. South Brisbane has one such, quite small and on a busy road, but with seats for rest and reflection.

Single trees were planted to commemorate battles, individuals, units and anniversaries. Trees raised from seeds of the trees at Gallipoli were planted in several places. The plaque on one planted by the Duke of Gloucester in 1934 at the Australian War Memorial in Canberra tells a touching tale:

After the capture of the Lone Pine Ridge in Gallipoli (6th August 1915), an Australian soldier who had taken part in the attack, in which his brother was killed, found a cone on one of the branches used by the Turks as overhead cover for their trenches, and sent it to his mother. From seed shed by it she raised this tree which she presented to be planted in the War Memorial grounds in honour of her own and others' sons who fell at Lone Pine.

#### Roads of Remembrance

Strengthening the bonds of Empire was particularly important to Britain after World War I.<sup>37</sup> Its forestry expression can be seen in the 1920 Empire Forestry conference in which Western Australia's Conservator, C.E. Lane Poole, and Australia's wartime Governor-General, Sir Ronald Munro Ferguson (by then Lord Novar) played prominent parts. Its arboreal expression can be seen in the gift of English trees sent out from Kew Gardens which were planted in Canberra

by the Duke and Duchess of York, the Governor-General and members of Parliament at the opening of (now the Old) Parliament House in 1927.

Britain started a programme of building nationally-funded 'arterial' roads linking its major centres in 1920. Their borders were to be planted with trees. A Roads of Remembrance Association was formed to which Australia's High Commissioner, Sir Granville Hicks, was appointed as a member of its Council. Sir Henry Barwell, South-Australia's Agent-General, also played a role. When a public gift of memorial trees from different parts of Australia was suggested during a particularly cold spell in December 1928, Sir Henry prudently advised that Australian native trees were unlikely to survive such frosts. Nevertheless, the matter was consigned to Canberra who consigned it on to Town Planning Associations in the various States. The Queensland Forest Service sent some bunya (Araucaria bidwilii) nuts, and the Tree Planters Association in Victoria, being delighted in 'the opportunity to be represented in the Mother Country', sent a parcel of seeds. The proposal petered out but the idea of long roadways of trees was to re-emerge in Australia after World War II.

# World War II, 1939-45

World War II was marked by memorials very differently from World War I. Empire fervour did not cut as much ice in 1939—the horrors of the Western Front had seen to that—but it was still assumed that Britain's war was Australia's too. Three Divisions of volunteers sailed off to fight in Greece and North Africa and another was sent to Malaya. The situation changed quickly when Japan attacked Pearl Harbour, swept through Malaya and Singapore, capturing the 8th Division, and bombed Darwin in February 1942. The other Divisions were brought back to defend the country and, after a few months of dispute, conscription for service in the Pacific sphere was approved without referendum. Australian troops in the Pacific served under the overall command of an American General, MacArthur, not a British one.

There were powerful social changes so that the Australia of 1945 was a very different country from that in which the Lucas Girls had started planting their avenue in 1917. Their daughters were more likely to be in a munitions factory, or working on a farm, or in the forces themselves than their mothers; and they waved to the GIs arriving as much as at the local lads departing. And when the war ended, they were caught up in the general rush to reconstruct the country in a confident and more independent way. The wartime rush to industrialise accelerated, the soldiers returned and migrants flooded in, the Snowy Mountains scheme and the Holden car factory were started, and more factories, sawmills, houses, roads, schools and universities all had to be built. Australia was very busy.

The mood and expression of remembrance was changed. Inglis depicts the factors underlying this and details its nature.<sup>40</sup> The pomp and pride of declarations of a national 'coming-of-age' which had been so prominent in 1915 could not be repeated. Although more people served in the forces than in World War I, fewer died and of these over 8,000 died as prisoners, mostly in the hands of the

Japanese. Whereas the Australian withdrawal from Gallipoli, like the British escape from Dunkirk, had entered the national legend, the battles of World War II were less clear-cut and the death of so many prisoners was a painful memory. The 'high diction' of 'laying down' life as 'sacrifice' seemed less appropriate to a conscripted army, especially to one in the Pacific which was sometimes able to have home leave in a way never possible earlier. And Australian losses came to be seen against the world canvas of the war, the Jewish genocide, the Polish massacres. Hiroshima and Nagasaki.

Stone monuments, so typical of World War I, were not required, or so most people felt, preferring that memorials, if any, should have a socially useful purpose. Hospitals, halls, parks, swimming pools and schools were favoured and it was found sufficient in most places to add new names to old monuments. Inglis depicts this as 'the triumph of utility' and to an aesthetic which found monuments old-fashioned. He sees it as driven by the contemporary demands for facilities and does not admit that it may have been driven with just as much true feeling by a different sense of what was fitting. Grief can be expressed in other ways than granite.

Some places did erect new monuments, as did particular units, but more often new inscriptions were simply added to the earlier monuments. It was common for many years to pass before they were so that the additions frequently noted Australia's involvement in the Korean War (1950-53), where 369 Australians died, and the Malayan emergency (1955-60), where 60 died.

#### Avenues of Honour

Avenues of Honour followed much the same pattern as monuments although there were additional factors and a new form, Remembrance Roads. In Victoria, four of the original avenues planted after World War I were extended and ten new ones were planted, while five of the eight avenues in Western Australia were extended. The decline of their popularity in Victoria was probably partly related to the failure of many of the original plantings. In 1987 Haddow could only locate 56 of the 132 avenues originally planted and, although she attributed many of the losses to road works, it is reasonable to assume that some avenues had failed or been lost before 1945.

The extensions were usually made with the same species, while some hardy Australian species were favoured for the few new avenues: red flowering gum at Drouin, various eucalypts at Footscray, mahogany gums (E. botryoides) at Puckapunyal and the popular sugar gum (E. cladocalyx) of Victoria's Western District at Pyramid Hill. Planting in Kings Park was more complicated because the Honour Avenues were part of the development of the whole park and the dedication of trees to individuals had not always kept up with planting. In 1948, 300 sugar gums that were already established were dedicated to servicemen and women and to two war correspondents who had been killed. One section was dedicated to two units and one tree was dedicated to a father and son who had been killed in each of the World Wars. A small planting of sheoak (Allocasuarina fraseriana) and stone pine (Pinus pinea) were added in 1961. A total of

1111 trees were planted in the Park's honour avenues for the 11,000 West Australians who died in the two World Wars.

#### Roads of Remembrance

Road building and improvement was an important element of post-war reconstruction, and the notion of roadside plantings to make them more attractive was gaining more attention in the 1960s, just as it had earlier in Britain. In the United States of America, highway planting became associated with remembrance in 1945 when the National Council of State Garden Clubs initiated a programme which designated various State and national routes as Blue Star Memorial Highways as a 'tribute to the Armed Forces that have defended the United States of America'. States legislated to declare such roads and enable sections to be allocated to local Garden Clubs who took responsibility for their planting, maintenance and the repair of damage.

At least four Roads of Remembrance were developed in Australia after World War II as plantings on highways linking major centres. The most remarkable one consisting of almost 2500 eucalypts was planted by one man, J.L.F. Woodburn, along the Goulburn Valley Highway, south of Shepparton in Victoria, in honour of his dead son, Calder Woodburn. The rest required State and even Commonwealth-State organisation and some way of linking this to local activity. This contrasted with the Avenues of Honour (except Kings Park's) which were local initiatives.

The least successful of the schemes consisted of planting a row of pines (*Pinus radiata*) on either side of the Princes Highway between Sale and Stratford in Victoria, a distance of 16 kilometres. The route cuts across the Gippsland Plain and was burnt by grass fires on several occasions. Only scattered trees now remain. The third scheme involved planting the highway linking Hobart and Launceston but is not examined in this paper.

The most ambitious and prestigious scheme was for the Remembrance Driveway to be developed along the Federal and Hume Highways linking Canberra and Sydney, a distance of 282 kilometres. It involved the Commonwealth—which administered the Australian Capital Territory at the time, the New South Wales State Government, Sydney and other metropolitan Councils, and several towns, such as Goulburn, Berrima and Mittagong, on the route. Allan Correy has researched much of its history.<sup>45</sup> He shows that it was the rising American influence in Australia and the example of the Blue Star Memorial Highways, rather than the British precedent, which provided the model. A Garden Club of Australia had been formed and its inaugural President, Mrs Margaret Davis promoted a similar idea of local groups planting highways across the country. A National Memorial Highway Committee was formed in Sydney in 1952 which included influential Club members such as Lieutenant-General Frank Berryman, Colonel Charles Moses, General Manager of the Australian Broadcasting Commission, and Mr R.H. Anderson, Curator of the Royal Botanic Gardens in Sydney. The services of the Senior Town Planner for the New South Wales Department of Local Government, Nigel Ashton, and the Assistant Superintendent of Parks and Gardens in Canberra, David Shoobridge, were obtained to plan the project. Thus it had a wealth of organisational talent, prestigious connections, professional experience, the example of the earlier avenues to go by, and the practical support of the State and Commonwealth Governments.

Rather than single lines of trees in an avenue, the Committee decided to establish a mix of avenues, groves and memorial parks. The failure of many of the previous avenues and the monotony or distraction to drivers of long avenues were cited as reasons. Equally, it reflects a transition from the street tree origins of the avenues to a landscape gardening origin of the driveway. The decision increased the cost and difficulty substantially because private land had to be purchased for most of the groves and parks, whereas avenues could be planted on the public road reserves. Another major difficulty was that of recruiting local bodies to take responsibilities for sections.

The project had a very British launch in February 1954 when the new-crowned Queen Elizabeth planted two plane trees in Martin Place, Sydney, and a peppermint (E. nicholii) at the War Memorial in Canberra. It was well publicised through the ABC and in a brochure put out by the Committee. The brochure sought to raise funds, as the Kings Park project had, by asking relatives across Australia to sponsor trees at a cost of £10 each, and by asking for donations from business. It also asked some large companies to take responsibility for establishing and maintaining whole sections. John Fairfax Limited, British Tobacco (Australia) Limited, Anthony Horden & Sons Ltd, Colonial Sugar Refining Company Limited, John Lysaght (Australia) Ltd and the Steel Industry of Australia (BHP and AIS) were among those which did. To encourage more local participation, it formed three Auxiliary Committees, at Goulburn, Canberra and the Southern Highlands, which sought volunteers to work on developing various sections.

While the project did get off to a flourishing start, it was a long one, difficulties mounted, land was increasingly hard to buy, trees died and had to be replaced, weeding and other maintenance was needed, vandalism was a significant problem in places and the enthusiasm of a diminishing band of volunteers waned over the years. However, prisoners from the Goulburn and Berrima Gaols did some of the work, the Parks and Gardens Department did much of the work in the ACT and contractors maintained the areas sponsored by the larger companies.

By the early 1970s the project seemed virtually over and the Auxiliaries disbanded. Although it was far from the original dream, it had achieved plantings in nearly 50 different places along the route. Funding from the Commonwealth, under the 'One Billion Trees' program, the State and Qantas enabled some further planting in the 1980s and 1990s. In 1999 a number of roadside stopping places developed by the NSW Department of Main Roads were named after winners of the Victoria Cross.

# Other plantings

Planting single trees to commemorate particular units was widely practiced after World War II. Regimental or similar associations did so, frequently choosing the grounds of the Australian or State War Memorials for the purpose. The Trustees of the Shrine of Remembrance in Melbourne experienced:

...much demand by ex-service men and women and the relatives of the fallen for the allotment of specific trees to commemorate specific units, formations and other sentimental aspects of the toll of life and limb...<sup>50</sup>

The trees planted round the Shrine in this way were within its general 'sacred' ambience and provided a specific focus for survivors attending Anzac day ceremonies. In Kings Park, Perth, a single fig (Ficus microcarpa var. hilli) was planted in 1966 to commemorate the crew of HMAS Perth who had died in 1942. Several eucalypts planted round the Australian War Memorial in Canberra were subsequently named for particular units and women's services. A small olive tree was planted in 1991 in memory of those who died in Greece and Crete 50 years before.

# Vietnam war, 1962-1972

Commemoration of the Vietnam War was long delayed. Public opposition to the war and its selective conscription had mounted until the eventual withdrawal came to be seen quite commonly as a military retreat and a public triumph. Vietnam veterans have drawn—and probably overdrawn—parallels between their unheralded return to an Australia shamed by its involvement and the lack of fanfare when the Boer war soldiers returned to an Australia widely troubled by Kitchener's scorched earth and concentration camp policies. Four hundred and ninety-six Australians died in Vietnam compared to the six hundred who died in South Africa from a smaller population. Australian attitudes towards those who had fought and died in Vietnam changed slowly so that it was not until 1987 that 25,000 veterans marched in the Welcome Home Parade through Sydney streets, and until 1992 that the national Vietnam War Memorial in Canberra was dedicated. In other places, inscriptions were added to older monuments and a few new ones were created, such as that at Albury in 1987.

Albury and adjacent Wodonga are an important military centre with several camps in which soldiers who fought in Vietnam were trained. A Reconciliation Service was held from which the planting of two new Avenues of Honour followed. The Vietnam Memorial Avenue at Wodonga was planted in the road outside the Bandiana camp with close involvement of the Veterans Association, the Council and an Army unit which acts as custodians. It consists of 44 pin oaks planted in the median strip with an adjacent small landscaped park containing a memorial stone which reads:

This memorial drive was opened on the 11th day of November, 1991 by the Mayor of Wodonga, Cr. Les Boyes on behalf of the citizens of Wodonga. In honour of all those who served in the Vietnam War from 1962 to 1973 and is dedicated to the memory of those who gave their lives during the conflict.

Three years later, a long avenue of plane trees was planted at Albury on the road which runs past the airport and on to Hume Village. A section near the airport carries an Avenue of Honour sign and some of the planting and subsequent maintenance is believed to have been done by the veterans. Apart from the sign,

there is nothing to distinguish it from the rest of the municipal planting. The choice of plane trees echoes earlier planting near Hume.<sup>54</sup>

Extensions were made to older World War I and World War II avenues at Woodend in Victoria and probably at some other places. No survey of these has been located

# Memories and meanings change

So far this paper has told a history of planting the avenues of honour and remembrance. In the papers and theses cited, the avenues are discussed as important scenic and cultural features of the Australian landscape. They are seen as living artifacts embedded in an Australian cultural history more commonly recognised in the monuments described so feelingly by Inglis as Sacred Places. At the start of the paper, it was suggested that the history of avenues was distinguished from that of monuments by personal connection and senses of future and passing time. There is a further but elusive theme that needs to be stated even if it cannot be elaborated from the present research. It is the loss of avenues. Haddow's 1987 survey of Victorian avenues, mentioned earlier, could find only 56 of the original 132 avenues known to have been planted for World War I. 55 At first sight, the history of their loss is a boring tale of trees dying, roads being widened and power lines taking over. The salient fact that there were more lost than kept can hardly be ignored.

It is easy enough to plant a tree, but harder to ensure it survives. School and community groups commonly fail to prepare the sites adequately and the enthusiasm of planting is rarely carried on for the three or four years needed to ensure survival. We know that successful avenues took deliberate measures to overcome these problems: Ballarat employed a maintenance worker, Kings Park obtained professional advice when early plantings failed to thrive, and the Remembrance Driveway Committee had a 'Field Officer', A.H. Kemp, to liaise with local groups and supervise contractors. Of the unsuccessful avenues we know only in a general way that the selection of species unsuited to particular sites would be more likely to fail, especially during severe droughts. Fire was another hazard as in the case of the Sale-Stratford roadway. The loss of individual trees through traffic or other accidents, vandalism, or many other causes may destroy the avenue effect of regularity if they are not replaced. The combination of these various causes had led to widespread deterioration by the 1940s, in the opinion of the Melbourne Herald:

Avenues of memorial trees are not likely to be repeated [after World War II]. Except in a few districts most of these avenues have become eyesores through neglect and the theft of name tablets.<sup>56</sup>

Based on her survey in Victoria, Haddow considered that road widening was the most common reason for the loss of avenues. Road works were very much part of the modernising mood and rapid expansion of towns throughout Australia after World War II. For example, the avenue of honour planted in Horsham for World War I was lost when the main street was re-developed although one-half of the earlier avenue for the South African War was retained after residents objected to tree removals for development. Many of the surviving avenues deteriorated as trees died or were removed here and there. Name plaques were often lost or stolen. All the enamelled plaques at Rappville (between Grafton and Casino) have long gone<sup>57</sup> and even the great avenue at Ballarat had lost nineteen per cent by 1997.<sup>58</sup> Many surviving avenues, especially in the smaller places, have no sign that they originated as avenues of honour.

Although a majority of the avenues have been destroyed, neglected or forgotten, there are a considerable number which are preserved, cared for and remembered. There is no comprehensive survey of what is happening to them, but four types of activity can be mentioned here. Local memory, care and action persist in some of even the smallest places. The residents of Eganstown (Blanket Flat) made a small cairn with the help of the Daylesford RSL in 1992 'replacing Avenue of Honour trees' and in 1998 planted some small cypresses around it. Lakes Entrance chose an unusual solution when the line of Monterey cypresses planted in 1924-5 had to be felled. After protests from the Historical Society, the Council engaged a chainsaw artist to turn the huge stumps into commemorative figures: a soldier, a nurse, Simpson and his donkey. At the other end of the scale, the Rotary Club of Ballarat South launched 'an impassioned plea to the people of Ballarat' to contribute \$80,000 towards a Restoration Appeal.

Two avenues—Ballarat and Creswick—gained national recognition by being entered on the Register of the National Estate, although this did nothing necessarily to fund their maintenance. Other avenues have gained State or municipal recognition as heritage sites and have found their way into municipal heritage management plans. The Commonwealth's 'Australia Remembers' program which marked the fiftieth anniversary of the end of World War II not only stimulated widespread interest but provided funds to a wide range of projects conducted by local Councils and other bodies. Some erected new avenue signs or contributed to restoration and maintenance.

How far does the history of the avenues 'bear a touching resemblance' as Strutt would put it not to 'the destiny of man' but to the construction of Australian history? The great themes—triumphalism, loyalism, emergent nationalism, grief, honour, local spirit—are all there. But so too are themes of neglect and forgetting, heritage and its management. As the trees have aged, so have memories changed.

# Acknowledgements

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### **Notes**

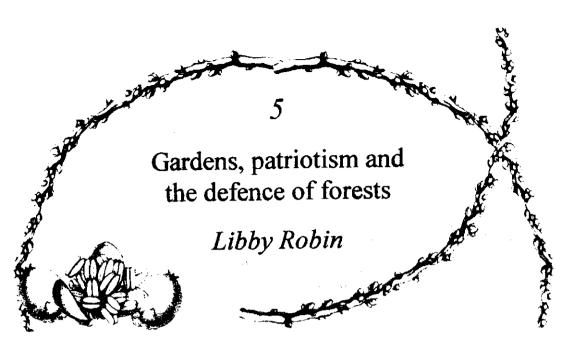
# AA = Australian Archives; AWM = Australian War Memorial

- Ballarat Courier 4, 5 June 1917; Souvenir of the Avenue of Honour, 4th June 1917. Ballarat: E. Lucas & Co. [1st edn]. The women planters are named as 'Miss' with very few as 'Mrs'.
- 2 Tree 4 for Daniel R. Weeks, enlisted 8th Bn.9 July 1915.
- 3 Tree 880 for 4288 Edward Norman Pinney, Pte, 14th Bn. Enlisted Ballarat. Died 8 Aug 1916. Cemetery 26, Villers-Bretonneux, AWM Roll of Honour. Called Norman E. Pinney in Ballarat. Souvenir of the Avenue of Honour.
- 4 Tree 2504 for Robert Quanchi, enlisted 8th Battalion, 28 August 1916. Noted as died in the Ballarat, Souvenir of the Avenue of Honour, but not recorded in the AWM Roll of Honour. Tree 2506 for George Buddle, Motor Transport, enlisted 1916.
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- 6 Bean, C.E.W. editor of the 12 volume Official History of Australia in the War of 1914-18 (1921-42) and author of 6 of its volumes and other books; Gammage, B. 1975. The broken years. Ringwood, Vic. Penguin Books.
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- 9 Jacob George Strutt 1826. Sylva Britannica.
- 10 A study of memorial halls, hospitals and the like might also shed a further light.
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- 13 City Council of Ballaarat. Mayor's Annual Report. 1876, 1877, 1878, 1883, 1887.
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- 17 ibid 1916-17
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- 21 de Garis, B.K. 1974. 1890-1900. In Crowley, F. (ed.), A new history of Australia. Melbourne: William Heinemann, p.254.
- 22 C.M.H. Clarke 1981. A history of Australia, v. 5 The people make laws 1888-1915. Melbourne University Press; S. Macintyre 1986. The Oxford history of Australia, v. 4 The succeeding age 1901-1942. Melbourne: Oxford University Press.
- 23 Mollie White 1964. The golden thread: the story of a fashion house: E. Lucas and Co. Pty Ltd, 1888-1963. Ballarat: the company. Interview with Madge Dunstan, one of the Lucas Girls, Ballarat Courier 11 November 1997. There were 500 or more women (and only two men), who started when they were 15, employed in the factory, Ballarat Courier 13 January 1998.
- 24 C.E.W. Bean. The official history... op.cit. v. IV: 544-5.
- 25 D. Holloway. Ballarat's Avenue of Honour for the family historian. Ancestor Summer 1991/92: 15-16. Holloway reports that 3912 enlistments from Ballarat represented about one-

### Dargavel-Avenues of Honour

half of the number of eligible young men. The death rate of 14% is slightly less than the national average of 16%. 3771 trees were planted in the Burrumbeet Road avenue and 490 in an avenue at Ballarat East. The difference between Holloway's total and the avenues is not explained.

- 26 Ballarat Courier 5 June 1917.
- 27 ibid 3 September 1917.
- 28 Cited by K. Inglis in working file on Ballarat, AWM uncatalogued.
- 29 Ballarat Courier, 3 June 1918.
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- 32 Oline Richards 1996. War memorials in Western Australia. Como, WA.
- 33 Inglis, op. cit: 390.
- 34 Paul Wycherley 1994. The Honour Avenues in Kings Park. Landscape Australia 3/94: 219-22.
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- 36 2256A Pte William Edward George Salter, 11th Bn, AIF, killed in action 23 August 1918.
- 37 To protect her position in the world against the ascendant economic power of the USA.
- 38 Sir Henry Barwell to Sir Granville Hicks, 14 Dec, 1928 AA I395/1/1
- 39 J. Owens, Hon. Secy. Victorian Tree Planters Assoc. to Hon. Secy. Roads of Remembrance Assoc., 1 October 1929 – AA I395/1/1.
- 40 Inglis, op.cit: 349-51.
- 41 ibid: 352-8.
- 42 Haddow 1987. op.cit, Richards op.cit.
- 43 Wycherley, op.cit.
- 44 It consists of a double row of trees on either side of the road of Eucalyptus camaldulensis, E. citriodora, E. leucoxylon, E. maculata, E. melliodora, E. polyanthemos and E. sideroxylon.
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- 46 Surprisingly for such a noted Anglophile, Sir Robert Menzies, only allowed two of the fifty pine trees he had been sent from Britain to be planted in the Driveway AA 827/2/31
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- 48 Interview, L.T. Carron, former Secretary of the Canberra Auxilliary, 11 March 1999.
- 49 Sydney Morning Herald, 6 September 1973; Correy, op.cit.
- 50 Secretary, Shrine of Remembrance Trustees to Secretary, Dept of the Army, 2 May 1952, AWM 113.
- 51 Inglis, op.cit: 429.
- 52 Damian Ley, Murray Border Vietnam Veterans Association, telephone interview 25 January 1999.
- 53 Weekend Australian, 27-28 February 1999.
- 54 The Hume Dam was completed in 1936, but the plantings appear more recent.
- 55 Haddow 1987, op. cit.
- 56 Herald (Melbourne), 28 Nov 1946.
- 57 Pers. comm. B. Stubbs, Lismore. Some of the plaques may have been overgrown by the trees.
- 58 Marc McWha Pty Ltd 1997. Ballarat Avenue of Honour Management Strategy Plan: 27.
- 59 Gippsland Roundup 14(1): n.p., 1999.
- 60 The Courier, Ballarat, 17 Oct. 1998.



All things bright and beautiful, All creatures great and small, All things wise and wonderful, The Lord God made them all. Each little flower that opens, Each little bird that sings, He made their glowing colours, He made their tiny wings.

(Hymn 573, Hymns Ancient and Modern)

A century of Sunday school children have unthinkingly and tunelessly chanted these words. Some have argued that the ulterior motive of the writer was to instil in children a certainty about creationism, which could withstand the onslaught of the theory of evolution. I believe, however, that the appeal of these words is more primitive. The wisdom and wonder of the natural world is being held up to the young child as a wholesome and worthwhile subject for study and moral improvement. The other theme, which comes back to me from earliest Sunday school days, is that of work: 'Work is sweet for God has blest /Honest work with quiet rest'.

The notion of gardening as a worthy and wholesome enterprise was in evidence throughout much of the nineteenth century. The close study of nature and wholesome hard work were seen to be morally improving to all, but especially to the young, the 'morally unfinished' who needed to work to grow into worthy citizens. Nature was a serious part of the Sunday School curriculum.

# **School Gardening Movement**

Cyril Isaac, a young school teacher in Victoria, was concerned about gardens as aesthetically pleasing environments and saw them as crucial to the mental and spiritual well being of school children. He was a practical person with a strong

sense of civic duty. He believed that children should work in the garden, and that this should show concrete results. Utility was an important—and morally relevant—feature of a good garden. In 1908, when he was teaching at Barnedown school near Bendigo, Victoria, a devastating drought stripped his carefully nurtured school garden of all its plants. The following year, the resourceful Isaac proposed a co-operative venture to exchange seeds and plants among enthusiastic teacher-gardeners in the Bendigo area. Frank Tate, the Director of Education in Victoria from 1902 to 1929, shared Isaac's feeling that resources—whether they be seeds or plants from gardens—should not be 'wasted', but shared, and saw the potential for this sharing to lead to a 'team spirit'. He also saw the potential for school gardens to be more than simply beautified public spaces. They should be places of learning, part of a curriculum to morally improve the participants. Tate invited Isaac to speak at a major meeting in Melbourne in 1910, where a vote was taken to establish a Victorian State Schools' Horticultural Society, which became the backbone of a 'school gardening movement'.

Isaac recognised that the school gardening 'movement' would be more morally effective if its collective aims embraced something larger than itself. In 1916 he turned the young gardeners' minds to the Education Department's War Effort. There is no evidence that he and Tate discussed this, but given the moral fervour of war, and the high profile given by Tate to the War Effort, it was logical that Isaac would look to combine the Horticultural Society and the efforts to support Education Department officers serving in the war and their families.

For a mere penny, young garden enthusiasts could join a new club, the 'Young Gardeners' League'. Its members were distinguished by the fact that they each cultivated a home garden plot—usually of 100 square feet [9.3m<sup>2</sup>]. The plot was worked to produce flowers and vegetables, which the Young Gardener would then sell for the going market rates. Parents, neighbours and friends all supported the child's efforts in this way. Proceeds went to the War Effort alongside other efforts by the Young Workers' Patriotic Guild.<sup>2</sup> The enthusiasm of the Young Gardeners was directed towards the worthy focus of a major state-wide event-a Flower Day Show—held at the Melbourne Town Hall on 3 November 1916. It was a place where the 'local' could become national and international, by association with the Great War. The hall was decked with flowers grown by members of the Young Gardeners' League throughout the state, and admission was charged. Isaac announced that he hoped to raise £10,000 with the Flower Day. In fact over £32,309 was raised in that one year, including revenue from home produce, and there was not enough room to display all the flowers sent in by the schools of Victoria. 'The blooms sent in from various inspectorial districts to be exhibited at the Melbourne Town Hall...came in batallions', wrote Isaac in the language of the day, 'In these circumstances it would have been unfair to award first and second-class certificates; so it was decided to present a special certificate to each school that assisted.'3 Isaac promoted co-operation above competition and sought to share as much as possible the glory of the success of the day.

Flower Day's biggest success was in its elegant 'efficiency': it converted seemingly idle land—an unused corner of a home garden, and it utilised the skills

of children too young to otherwise give service to the war. No one could accuse Isaac of exploiting under-age labour because of the improving value gardens were deemed to have for young people. An anonymous journalist writing for the Australasian about the new gardeners' league noted that: 'Simple instructions in rudimentary gardening, which should be valuable to the children are being distributed'<sup>4</sup>. Patriotism and gardening became inextricably linked in the inimitable style of progressive utilitarianism.

# Progressive utilitarianism

The early decades of the twentieth century were an era of 'progressive' thinking. A garden was seen as an ideal place to combine morally uplifting contemplation of nature and worthy hard work. There were also those who felt that while the garden could provide moral solace to the individual, there was a need to venture beyond private fences, to work collectively. A school garden was a *community* garden, not just something for private citizens. It fitted into a wider, collective world—the overlapping world of the education system and of the local community. It also involved and improved the 'new generation'.

'Progressive conservation', with its maxims such as 'waste not, want not' and its concerns about the responsible stewardship of nature were central to ideas about connections between nature, hard work and moral improvement. As Michael Roe has argued in his book *Nine Australian Progressives*, a 'progressive' creed 'insisted that a vitalist polity must be organic, integrated, and purposeful, with the general good ranking far superior to individual advancement'. It gave an important role to 'the state' and its touchstone was 'efficiency' (despite the difficulties in defining the term objectively). Its heroes were rather more often American than British. It was, perhaps, one of the forces operating to detach Australia (gently) from the imperial bosom, despite the fact that many Australian Progressives would have still called England 'home'.

Progressive conservation's most famous protagonist in this era was Gifford Pinchot, the first professional forester in America, who sought to manage forests for 'sustained yield'. He popularised the term 'conservation' through a Conservation League of America (established in 1908), which he established to arouse public support for 'progressive development' through the professional management and wise use of natural resources, especially water and timber.<sup>6</sup>

In Australia, 'progressive' thinking extended well beyond 'conservation', but conservation was an important plank in the Progressives' broad platform. The Director of the Victorian Education Department, Frank Tate, a quintessential progressive, was articulate about the role of the State School in stitching together the fabric of society. For Tate, a school was an 'efficient' unit of organization and a way of reaching into nearly every home. The school was a place of good instruction for the public (the whole family) and not just the individual (the student). The Gazettes of his long era were conscious not only of teachers and students but also of the families and school communities that were part of Tate's 'Education System'. Tate encouraged the emergence of a 'School Gardening

movement', a movement that during the Great War, brought even the private garden into the public education system.

School gardening went hand-in-hand with tree-planting activities. Here, the altruistic element was even stronger, for the trees the children planted were not for themselves but for the next generation. Whereas in a garden, the efforts bore fruit in a matter of weeks, the results of tree-planting, especially the sorts of specimen trees that were often chosen, took years.

# **Arbor Day**

A striking feature of forestry education in the early twentieth century was that it was so closely modelled on and derived from garden education. The Australian Natives Association (a patriotic group that comprised Anglo-settlers, not Aborigines) was a patriotic sponsor of both annual School Garden Competitions and of the Arbor Day concept. Arbor Day—always spelled the North American way without the 'u'—was about arousing the interest of children in the planting and preservation of trees. It was an effort to turn the tide after a century of ringbarking. It was well-known in Canada by the 1880s. In the Australian context, Arbor Day began in South Australia in 1889, and was held first in New South Wales in 1890, when Lord and Lady Carrington planted trees in the reserve at Ryde Public School. Later Arbor Days were more directed towards involving schoolchildren, not just visiting dignitories, as planters.

One Sydney collection of 'songs, poems and plays suitable for presentation on Arbor day' in 1940 includes 'The Lesson of Arbor Day':

Long ago, when the first white men came to Australia this country was covered with wonderful forests...

Then the settlers came, and the ring of the axe was heard for the first time. The giant gums came crashing to the ground and were used for building houses and sheds. The settlers needed paddocks in which to grow grass for their cattle and food for themselves. So they set to work to clear away the forests as quickly as possible. This was often done by means of a bush fire. People in those days thought it did not matter if timber was wasted. There were so many forests.

For a hundred years and more the people have been using timber from our forests...Do you wonder then that there are not many forests left today?

What shall men do in the years to come?...If we do not plant more trees to make up for the ones we have used there will be very little timber for those who live after us...<sup>11</sup>

Many school children planted trees in their grounds and neighbourhoods after hearing a rousing 'message' like this one. Each year schools dutifully reported to the various Education departments on their 'Arbor Day activities'. Sometimes any association with trees was enough. One Gippsland school early in the century reported proudly that they had had a working bee—and had cleared the block next to the school of trees!<sup>12</sup>

# Australian Forest League

It was not only schoolchildren who were being encouraged to consider the virtues of trees in this period. At an interstate conference of forestry in November 1911, professional foresters mooted the idea of a general association for the advancement of forestry. This idea was greeted with enthusiasm by the Botany section of the 1913 meeting of the Australian Association for the Advancement of Science, through its secretary, Dr C.S. Sutton. The first Forest League was in Victoria, but the movement soon spread to other states.<sup>13</sup>

In March 1917, despite wartime exigencies, the Victorian Forest League began to publish a journal, the *Gum Tree*, which was published until the mid-1950s. The journal's aims were:

The education of the public by all possible means to a realisation of the value of Forests and of the evils resulting from their destruction, so that eventually a Forest Consciousness shall be created in the public mind.<sup>14</sup>

The Gum Tree's lavish production was made possible by the strong financial backing of, amongst others, the League's vice-president, Russell (later Sir Russell) Grimwade. 15 Grimwade had a passion for trees, forests and forest products. He was a fine wood-craftsman, and had major business interests in timber and eucalyptus oils. He was also (incidentally) an enthusiastic gardener, as the grounds of Miegunyah, his home in Toorak, testified. But within that lovely garden it was the trees above all else that Grimwade valued. John Poynter, Grimwade's biographer, records the story of a fire in 1919, which broke out near the garage housing Grimwade's two valuable motor vehicles. 16 The fire brigade rushed to the scene and began playing water on the garage in an effort to save it and its contents. Grimwade burst on the scene, semi-dressed for dinner and uncharacteristically began to shout agitatedly: 'The tree you fools, turn it on the tree!' The fire brigade obediently turned their hoses on a prized elm. which had begun to singe. This saved the tree, but the garage and cars burned. Grimwade, relieved that the tree had not been lost, explained later that one could always buy a new car and build a new garage, but it had taken sixty years for the elm to grow.

The Victorian branch of the Forest League flourished with Grimwade's support. It regarded its most important early achievement as the pressuring of the Victorian Parliament to establish an independent Forests Commission in 1919. The Gum Tree publicised many of the activities of the new Commission, especially those with a civic aspect or which were of particular interest to the general public. The League of Tree-Lovers, modelled on the Young Gardeners' League of the war years, enabled outreach by the Australian Forest League to junior audiences.

## **School Endowment Plantation Schemes**

The success of School Garden and Home Garden schemes and of Arbor Day generally, created the opportunity for a different type of venture. During the twenties, the formidable progressive forces of the new Victorian Forests Commission and Tate's Education Department joined forces to promote forestry in schools through a joint venture, the School Endowment Plantation Scheme. The League of Tree Lovers quickly affiliated itself with the scheme.

The School Endowment Plantation Scheme was managed in Victoria by an 'Organiser of School Forestry', who saw 'Progress' in the first two years (1923-4) as follows: '1200 acres [486 ha] of waste, idle land have been utilised for school purposes...During last planting season 25,000 trees were put out in these plantations'. Revenue was the primary aim of the plantations—and the revenue was for a worthy cause, the schoolchildren of future generations:

As these plantations become revenue producing, the proceeds are invested by the trustees...to be used for the provision of educational facilities such as scholarships, bursaries, equipment, etc, in that school.

Thus the moral worth of the plantations was unquestionable, and local and civic pride would ensure their success. There was however, a broader agenda:

through the schools an endeavour is being made to educate the public...In the preliminary work of enlisting the interested support of the local people in the school plantation scheme, it is necessary to get these bodies behind the movement. In this way they are becoming more interested and enlightened in our forestry questions.<sup>17</sup>

What is striking is that the actual worth of forests is not explained in detail anywhere. Observation of growth and understanding of planting procedures are obviously useful to making young people interested in trees, but the 'supreme importance of forests' and 'the great advantage of plantations and tree planting generally' was never really discussed. It was perhaps assumed that this would be gained through the ceremony and sense of occasion which were often features of Arbor Day efforts in school plantations. The rites of planting were themselves educational. Like motherhood, the nurturing of young trees required no rational argument to be deemed to be a Good Thing. The trees themselves, like ancient Druids, were given the role of inspiring a forest conscience in the new generation. This generation 'alive to the virtues of trees' would ensure the 'proper conservation of forests'—proper conservation being 'use without waste'.

The virtues of trees perhaps could not be too clearly spelt out because of tensions within the so-called movement itself. The Forests Commission supplied the trees and the Education Department the planters. These organisations had different reasons for supporting the School Plantation Scheme. Apart from the primary purpose of revenue raising, the Scheme offered both participating organisations advantages. The Forests Commission was keen that the general public became more aware of the importance of their timber growing endeavours on public land, and so become more supportive and cooperative with these. It also

wanted more trees planted. The Education Department under the direction of Frank Tate felt that a young person's education would benefit from this very practical form of Nature Study. The scheme also offered a moral dimension in that planting trees served to underline youth's sense of 'duty to those who come after them'. The aims could work together and endow the schools of the future.

School Forestry in the 1920s and 1930s emphasised working together for a common good. While this was a worthy aim, it left the movement somewhat bland and lacking a sharp focus. The rising militarism of the late-1930s inspired a different, much more aggressive form of forest conscience that identified a specific enemy of forests, a problem to fight against in order to protect forests. A common enemy could unite the movement far more efficiently than a common good, as wartime patriotism revealed. That enemy was fire. And the event which caught the public imagination was Black Friday, January 1939.

# Save the Forests Campaign

The Black Friday fires of January 1939 cost seventy-one lives and burned out 1.4 million hectares and nearly 5 million cubic metres of timber in the Central Highlands near Melbourne. Following a career in the nursery business and in local government in Dandenong in the 1920s and 1930s, Cyril Isaac joined the Victorian Parliament in 1940 just as the movement for improvements to forest management through professional forestry practice had taken a new and serious turn in the wake of this crisis. The influential Royal Commission of Judge Leonard Stretton had urged a more broadly 'public' face to forestry, and it was Isaac, with his experience of a youth movement for gardening, who took up the challenge to make this a moral cause in the progressive conservation tradition.

Isaac's drive to 'build a forest conscience' started with school children and local government—two sectors where he had influence and networks. His 'community forests'—the first of which was in his own suburb, Dandenong—were a co-operative venture between local government and the school children of the community concerned and quickly drew the support of the State's Forests Commission.

The Save the Forests Campaign, established early in 1944, was brought together utilising the strengths of the Forests Commission, Education Department, and the recently revived Australian Forest League. The high-profile senior industrialist, Sir Herbert Gepp, Managing Director of the Australian Paper Manufacturers Ltd., another distinguished 'progressive', organised the public meeting which voted to campaign to save the forests. It was Cyril Isaac, however, who became the driving force behind the organisation. The Save the Forests Campaign freely utilised the colourful language of the Stretton Royal Commission into the 1939 bushfires and also the rhetoric of war. Images of patriotism and militarism were used to urge the public to take on that enemy of forests, fire. The Campaign's first tasks were to plant trees to last beyond the war, to assist with 'post-war reconstruction'. But the tree-planting activities were

also designed to sow moral seeds in young minds, to make children (and their parents) value trees and forests.

# **Community forests**

Community forest plantations were instigated even before the war had finished. The first, in 1944, was in Dandenong, in the heart of Cyril Isaac's own electorate. Trees were planted in straight rows, simultaneously by many planters, at the blow of a whistle. The intriguing militarism of this war-time tree-planting event alerts us to the fact that the sense of occasion was as important as the forest itself. The prime purpose of the day was education not forestry. The community forest was designed as an icon for public commitment to sound and altruistic future planning. It was a 'garden forest'—a way of educating the public about 'real' forests. There was no question that real forests should be managed by anyone other than professional foresters, but the message broadcast implicitly at the community forest 'events' was that forest professionals needed the support of the community.

The campaign could not afford to be coy about the central implication of Stretton's report, that people rather than fire were the enemies of forests. Gepp, Isaac and others would have been nervous of alienating the powerful grazing lobby by suggesting directly that it was fires lit for fresh green pick which were a major problem to Victoria's forests. Working from his position in the Parliament, Isaac chose to press for another Royal Commission in 1946, this time into forest grazing. The Commissioner was again Leonard Stretton. It was this report that saw sheep removed from some of Victoria's most sensitive watersheds, the Alps. New South Wales followed suit, and took the recommendations further, removing both sheep and cattle from the high plains in the 1950s. The battle to remove cattle from Victorian Alpine areas continues to this day.

The Save the Forests Campaign popularised Stretton's memorable phrase: the Inseparable Trinity. 'The Inseparable Trinity' of Forests, Water and Soil was the centrepiece of the Campaign's conservation strategy by the late-1940s, publicised through radio interviews and many public lectures given by Cyril Isaac himself. When, for legal reasons, the Campaign sought to incorporate in the early-1950s, the name that they chose for themselves was the Natural Resources Conservation League. The new League was proudly a 'conservation' organisation with a crusading message. But it also functioned to continue the earlier tradition of gardening as a morally uplifting activity. Cyril Isaac's early and important initiative in setting up a Research Nursery for the Save the Forests Campaign was to shape the public face of the Campaign and its successor, the Natural Resources Conservation League. In his original blueprint presented to the Executive in 1946, he described the Nursery first of all as a 'service' to members—rather like hospital benefits were a 'service' to Australian Natives Association members. He also saw a nursery as a permanent focus for the movement. The nursery was specifically designed to facilitate major community tree-planting activities, something for which commercial nurseries were ill-equipped. Isaac wrote:

...it seems more important to have an organized community planting in which scores or hundreds of people take part, even if it means going to some trouble to have trees arrive on a particular day, than to simplify despatch by sending the trees when it is most convenient to the nursery.<sup>22</sup>

The Save the Forests Campaign's most important audiences, however, lay outside the metropolitan area, where forested areas were still steadily being cleared and fired. Isaac sought opportunities to publicise the Campaign's ideas through practical tree-planting demonstrations throughout the state. One of the first and biggest of these was at Charlton in north central Victoria on 22 August 1947.

Charlton's motivation for participation was clearly civic pride. Here was a town whose chief form of civic self-expression was tree-planting. Like many country towns, Charlton had marked its landscape with that peculiarly Australian form of memorial, the Avenue of Honour. Honour. Memorial avenues, predominantly of sugar gums, radiated in every direction from Charlton's centre. Unlike the original Avenues of Honour, however, many of these did not commemorate individuals who fell or served during a war. And not all stands were in long rows. Most stands of trees were named collectively. They were more likely to honour a long-serving Shire Councillor rather than a series of individuals. The new civic tradition of plantations—stands of trees in groups rather than Avenues—is a post-World War II phenomenon, as John Dargavel has argued. The Charlton Community Forest, begun in 1947 and completed in 1950, reflected that change in tradition. The Charlton Community Forest Planting was an event in the social calendar. Shops in town were shut for the afternoon, the local newspaper devoted a whole issue to the event. The plantation became almost incidental to the event, except that it conferred a general 'worthiness' on the day's festivities.

The 1947 plantation had many of the elements of the organised landscape which was a feature of the original Avenues of Honour. Like the Avenues, the trees were planted in straight lines. But instead of single file, these trees were grouped like a battalion in blocks of twelve parallel rows, shoulder to shoulder. Divisions within the battalion were marked by different species—twelve rows of tuart, then twelve of grey box, twelve of black box, and so on. The planters likewise were classified by species—youth, women, men, Returned Soldiers, Country Schools, Charlton School and St Joseph's College. The Chief Marshall seemed more like a Sergeant Major than the local clergyman, the Reverend A. Mourell. The compartments of civic duty as reflected in the organisation of the day by age, gender and religion, were reinforced by the whole process. That ceremony in Charlton, full of formal ritual, seems in many ways far from Greening Australia and its efforts to plant a billion trees in the 1990s. The motivation of local civic pride has been replaced by that of global concern.

The level of formality and hierarchy would never be tolerated by contemporary community groups—formality is no longer fashionable. But the social history of these events is continuous, and can be traced to some extent by returning to the issue of School Forestry.

# Looking back and looking forward

There was some irony in the fact that by the time the School Endowment plantations had grown to a sufficient size to be revenue raising, Government support for schools had increased to the level that made them less essential to the school's welfare. However, the net return from sale of trees by 1972 (almost 50 years after the first trees were planted) had risen to nearly \$400,000. Many schools did very well out of their local plantation. The one at Bright, for example, made enough to have a desk hand-crafted out of its wood to present to Frank Tate. But many school plantations failed financially, not because the trees did not grow, but because of their distance from a saw mill.

Bill Grauer, the Supervisor of Schools Forestry from 1952 until 1980, commented on the changing priorities of the teachers and parents involved with School Plantation Schemes. In the 1950s and 1960s, there was a steadily decreasing concern with the timber-producing properties of trees. Instead conservation had become a major priority. There was an increase in the planting of noncommercial trees, especially those that provided shelter for birds and mammals. Such forests were perceived as a resource for the emerging subject of environmental studies. In 1972 Grauer wrote that the future of the Schools Forestry Branch lay in giving advice to teachers and providing resources for studying 'the interaction of man, his culture and his biophysical environment'. As we draw to the end of the twentieth century and school forestry has been abolished, the tradition of 'ritual' plantings has a new manifestation: in the form of 'rainforest regeneration' groups.<sup>29</sup>

This paper has traced various efforts made in the first half of this century to combine nature, hard work and community spirit and looked at the virtues proclaimed for a popular 'forest conscience'. 'Forest' and 'conscience' are not a natural pair. 'Conscience' with its overtones of 'guilt' is a real Sunday School word—and nature too, has not escaped the long reach of Sunday School morality. This sleight of hand is one of the hallmarks of progressivist thinking, and of progressive conservation in particular. Forest consciences were to be roused in adults, as well as children. Arbor Days, School Plantation Schemes and Community Forest plantations were all educational events, with a propaganda dimension. The moral dimensions of forestry were revealed in explicitly 'educational' campaigns (whether in school or in the wider community). There was a powerful lineage from forests and fire, towards defence and war, and finally to patriotism and conscience. There is, however, a different slant to these in the last few decades of the century when both military and Sunday School rhetoric are less prevalent. Patriotism is built on different values as we struggle to redefine 'community' in a global world. The changing attitudes to forest plantations reflect some of the changing moral sensibilities of the twentieth century. It seems that in 'leaping the garden fence', we have come back to some of the ideas that underpinned the culture and art of nineteenth and early twentieth century gardening. But Nature herself has globalised, venturing well beyond the restrictive garden walls of nationhood.

## **Notes**

- For more details, see Libby Robin, 'School Gardens and beyond: Progressive conservation, moral imperatives and the local landscape', in *Studies in the History of Gardens and Designed Landscapes*, Special Australian Issue (edited by Christopher Vernon) 1999 (forthcoming).
- See Education Department's Record of War Service. Other Young Workers knitted socks (over 200 pairs), assisted hospitals for returned soldiers with produce and baking and undertook contracts to maintain and light the street lamps in their village. (See Tate's 'Foreword': 4-5). The Young Gardeners' League was eventually absorbed into the Young Workers' League, but Isaac maintained separate records while he was in charge. The assumption that 100 square feet of garden was available to be devoted to this cause and that parents and friends were able to purchase the produce, suggests that most of the Young Gardeners came from middle class families.
- 3 Education Gazette and Teachers' Aid, 23 January 1917: 10.
- 4 Cutting from The Australasian (n.d., c. 1916) in MS 12733 3520/1, State Library of Victoria.
- 5 Michael Roe 1984. Nine Australian Progressives, St Lucia, University of Queensland Press: 10-11.
- In his book *The Fight for Conservation*, (1910, reprinted Seattle, Univ. Washington Press, 1967: 42), Pinchot claimed to have originated the term 'conservation', but as Susan R. Schrepfer has noted in *The Fight to Save the Redwoods* (Madison, Univ. Wisconsin Press, 1983: 11), this is not strictly true. Its use in popular parlance was no doubt facilitated by the formation of the Conservation League, and also Roosevelt's National Conservation Commission (1909). See Samuel P. Hays 1959. *Conservation and the Gospel of Efficiency*. Cambridge, Mass: Harvard University Press: 138, 141.
- 7 See also Tate, Foreword, Education Department's Record of War Service.
- 8 Arbor Day is now more commonly known as Arbor Week. The second week of May is Arbor Week in Victoria, whilst in Western Australia, it is the first week of June. ANA school garden competitions started in 1903. Cyril Isaac was an enthusiastic entrant.
- 9 The National Library of Australia holds microfilms of Arbor Day, Province of Quebec proclamations &c (c. 1883) and Arbor Day, Ontario suggestions and regulations in regard to its observance (1887), also J.C. Chapais, Arbor Day: a few advices to farmers on the planting of forest and ornamental trees, 1884.
- 10 Joan Webb 1998. Thistle Harris, Chipping Norton, NSW, Surrey Beatty: 50.
- 11 [Thistle Harris, editor] 1940. The Arbor Day Book: A collection of songs, poems and plays suitable for presentation on Arbor Day. Sydney, Australian Forest League (NSW branch): 15.
- 12 John Foster, September 1990, pers. com.
- 13 Gum Tree 1917. 1(1): 5.
- 14 The Australian Forest League, 'Aims and Objects' (No. 12), in Gum Tree 7(23), September 1922.
- 15 It is not insignificant that the last edition of *The Gum Tree* (13(4), 1955) carried an obituary by the Hon. Acting Editor, A.D. Hardy, for Sir Russell Grimwade (p. 8). Without Grimwade's financial backing, no further issues appeared.
- 16 J. R. Poynter 1967. Russell Grimwade. Carlton: Melbourne University Press: 101.
- 17 W.W. Gay, Gum Tree, c.1925
- 18 Tom Griffiths 1992. Secrets of the the Forest, St Leonards NSW, Allen and Unwin: 49.
- 19 More details of Isaac's nursery business and his local government career can be found in Libby Robin, 'Cyril Everett Isaac', in Australian Dictionary of Biography 14: 537-8.
- 20 See Libby Robin 1991. Building a Forest Conscience: An Historical Portrait of the Natural Resources Conservation League. Springvale: the League.

- 21 Michael Roe 1985. H W Gepp: His Qualification as Chairman of the Development and Migration Commission. Tasmanian Historical Research Association Papers and Proceedings 32: 95-110. Roe describes Gepp as a 'welfare capitalist'(p. 97) because of the way he established the industrial town at Lutana to service the EZ works at Risdon (of which he was General Manager from 1916). Lutana included a sickness insurance scheme, housing, home finance, an annual picnic, a co-operative store, a brass band and a scholarship fund, all provided by the company for the workers. Gepp 'filled to near-perfection the contemporary model of capitalist-as-reformer' (p. 96).
- 22 C.E. Isaac, 'Notes submitted to Executive by the Honorary Director—1946. Discussion of Research Nursery', unpublished typescript, National Resources Conservation League Archives, p. 1 (Item 4).
- 23 On Avenues of Honour, see John Dargavel, 'Trees age ...', this volume, Ch. 4 and Janine Haddow 1988. Avenues of Honour. *Meanjin* 47: 421-5.
- 24 For example, an 'F.O. Sanderson plantation' was planted in 1989, and when I visited Charlton in 1990, the ground was prepared for an extension.
- 25 See Chapter 4.
- 26 The significance of the twelve is not discussed. But Isaac's father was a Congregational Minister, and he would have been well aware of the importance of twelve in Biblical rhetoric.
- 27 The day's events were captured in *The Charlton Tribune*, 29 August 1947, and also on film. The NRCL has made a ten-minute video of the old film entitled 'You can do it', which shows the planting of community forests at Dandenong, Mornington and Charlton (NRCL archives, courtesy S. Quale).
- 28 Bill Grauer, pers. com. 6 September 1990.
- 29 See Brett Stubbs, Nineteenth century origins of some rainforest nature reserves in northern New South Wales, this volume, Ch. 8.



# Conserving





## Introduction

Forests, woodlands and their management are a neglected area in English history. Few works are devoted to forests and most are interested in woods only as a primary source of either fuel or building material. This is surprising because woodland had a role in national considerations from the dissolution of the monasteries in 1536-40, which brought a lot of wood into Crown hands, until the Restoration in 1660. Nef's claim that 'between the accession of Elizabeth and the Civil War England, Wales and Scotland faced an acute shortage of wood, which was common to most parts of the island rather than limited to special areas, and which we may describe as a national crisis without laying ourselves open to a charge of exaggeration' has been largely refuted. Indeed, Flinn has argued that the supply of both timber and cordwood between 1550 and 1750 increased substantially with little real rise in prices. Brinley Thomas, however, points out that this conceals a sharp comparative price rise in the first half of the seventeenth century which suggests a growing fuel shortage.

# Some preliminary points

Forests were areas, controlled by separate forest laws, which the king maintained primarily for his exclusive use in hunting of deer and other wild beasts. Like parks and chases, forests were established to protect deer not to produce trees. The seasons for hunting deer governed their management. Most forests were royal at least in origin while parks were more often in private hands, although they too were mostly designed for keeping the deer in. By the 16th century however one may wonder whether royal interest was in hunting reserves or the hunting of filthy lucre?<sup>5</sup>

The areas forests covered did not belong exclusively to the monarch and included private woods, villages and some monasteries like Ulverscroft.<sup>6</sup> The monarch's rights might be limited to hunting and include no land. Farmers living within the forests were primarily concerned with rearing stock, although there were often small common fields for growing grain. The farmers enjoyed extensive grazing rights (pannage) as well as allotments of timber for fuel and house repairs. They kept large numbers of pigs as well as cattle and in some places horses. Not all the area of a forest was wooded—a survey in 1641 showed that even the forest of Dean was only 55 per cent woodland.<sup>7</sup> Management of such wood-pasture areas involved temporary enclosures and restricted times of the year for grazing.<sup>8</sup>

Forests were run by officials in a complex hierarchy which established a web of privileges, duties and vested interests. Woods, however, were only an incidental part of those vested interests and where they belonged to the monarch they were run by woodwards. The woodwards were quite distinct from the rangers. Whereas the rangers were answerable to the forest bureaucracy, headed by the master forester and ultimately to one of the Justices of the Forests, the woodwards were answerable to the monarch's Receivers of Lands. The forests were divided into 'walks' which included coppice, ridings and plains under the control of a keeper or warden who was usually a nobleman or a member of the upper gentry. In some forests, like Delamere, the post of master forester was hereditary. His powers in the forest were enormous.

Whatever the legal position, subjects, particularly the elite, had by use and wont acquired rights within the parks and forests. Soon after his accession James attempted to shut a section of Windsor park but people made themselves private keys and broke down the fences. When Charles I revived the old forest courts of Windsor his action was bitterly resented and poaching in daylight was connived at, and even led by gentlemen.<sup>12</sup>

#### Woods

Calculations from the returns for the Domesday book suggest that woods covered 15 per cent of the surface of England in the 1080s. By 1350 this had dropped to about 10 per cent. Rackham believes that it remained at this level until the late eighteenth century when he sees further destruction of the woods. His chronology seems questionable. Some areas of England, such as Cornwall, were always lightly timbered. But so far as the general state of the country at the beginning of the 16th century is concerned, Leland's *Itineraries* suggests that many areas were still very heavily timbered, even though an act of Parliament in 1503 speaks of the forests being utterly destroyed. Schubert calculated that in 1660 coppice woods in Kent, Surrey and Sussex occupied 82,750 hectares. It

The subsequent 16th and 17th century clearances must represent at least a further two or three per cent of the surface, although this was not all attributable to royal action. By the end of the nineteenth century Britain had only 4.4 per cent or 659,000 hectares of woods, far less than Russia and Sweden (42 per cent), Germany (29 per cent) and Spain and France (17 and 16 per cent); even Denmark had 6 per cent. Britain imported substantial amounts of timber from abroad and

there were fears of a decline in supply which led to a movement to increase woodland in Britain.<sup>16</sup>

The most frequently studied aspects of demand for wood concern the iron industry and the navy. Hammersley reckoned that it would take about 5,200 hectares of timber to keep a sizeable blast furnace and forge going perpetually. As charcoal could not be profitably transported more than eight kilometres from its source (the circumference covers an area of 20,000 hectares), new furnaces and forges would have to be established in areas closer to new areas of woodland. This is, of course, the demand for underwood suitable for charcoal, not for the great timber needed for ships and building works, but the figures collected make it impossible to distinguish the two.

Wood-management practices were well established by the end of the Middle Ages. Properly managed woods yielded as much as arable acres to landlords. The underwood was harvested for fuel and poles, the great trees for building works and the like. Bark was essential for tanning and the tops and lops for a variety of uses. Because the care and maintenance of woodlands had benefits for the community, which went beyond the private interests of individuals, some regulations represent what we would see as formal ecological interest.

While the science of sylviculture may have been underdeveloped sixteenth century foresters knew a good deal about suitable management practices. The practice of planting seedlings or deliberately sowing seed had not developed and plantations were a rarity, but then it is still debatable whether planting trees in existing woods is a good idea. Allowing natural regeneration according to Rackham is a good thing, but according to Pettit and Hammersley, making plantations would have been better. Coppicing—usually on a twenty year rotation but often on a five, seven or nine year cycle—had been a widespread practice for many years before 1500 to produce poles for building, charcoal for salt evaporation and iron smelting, and bark for tanning. 19 This was usually practised in the structure of coppice with standards, fenced to protect the new shoots until the danger from animal browsing was past. In the numerous reports to the Exchequer on spoil, it was assumed that coppice with standards was the acceptable means of regeneration, with coverts of underwood and thorns which could also be coppied for increased wood. In the seventeenth century there were several writers who advocated timber conservation and were concerned with sylviculture.<sup>20</sup>

The foresters knew that protective belts of trees should be left to shelter regenerating areas from the prevailing winds and strategies were designed to prevent damage in woods used for cattle and pigs.<sup>21</sup> In some areas the trees were pollarded so that the new growth came above the level of animals but could be cut in winter to feed the deer. High forests with seedlings were understood. Clearfelling occurred but the foresters knew that some sort of shelter wood was needed in mixed woods with different species and different growing habits and needs (deep rooted with shallow, fast growing species to protect those slower to establish themselves). How well private practice observed the rules is hard to establish. Certainly in Cannock, the Paget family coppiced the Chase woodlands to enable a continuous supply of fuel to be available for the ironworks.<sup>22</sup>

# Different aspects of Crown management of woods

## Regulation by statute

Except for the statutes specifically relating to hunting, 23 or to law and order, 24 the management of woods was only marginally a Crown activity because although Acts were often put into Parliament by private interests, their enforcement depended on pursuing cases in the royal courts, mainly the Exchequer, where prosecution was left largely in the hands of informers and was sporadic. The sixteenth century statutes attempted to regulate the private management of woods. Parliament passed Acts which required certain basic practices such as leaving standells of mature seed trees when woods were cut so that the area could regenerate naturally. Such 16th century Acts were concerned with the trees then common in England-oak, ash, thorn, lime, birch and elm-although new species such as the Norway spruce were appearing and the seventeenth century was to see the horse-chestnut, sycamore, plane and others arrive. The Acts tell us a considerable amount about what was considered good practice but little about how widespread it was or who observed it. Such Acts were periodically renewed and the rights of owners were preserved. They might continue to cut for building, repairs, maintaining houses; for paling, railing, enclosing parks, forests, chases or other grounds; for repairing waterworks, dams, bridges, and flood gates; and for building and repairing ships and other vessels. Other Acts at this time related to regulations about enclosing parts or all of the forests. Preventing the squeezing out of commoners led to some detailed arrangements for their protection.<sup>25</sup> In 1559 another Act prohibited felling timber trees (defined as at least one foot [300 mm] square at the stubb) of oak, beech and ash to make charcoal within fourteen miles [22 km] of the sea or any part of the Thames, Severn, Wye, Humber, Dee, Tyne, Tees, Trent or any other creek used by boats (except in Sussex and the Weald of Kent and the parishes of Charnwood, Newdigate and Legh in Surrey). The requirement of twelve standards on an acre [30 per ha] continued in the 1580s, 26 but like the requirements of earlier Acts was rapidly rendered less effective by the royal grant of exemptions to favourites.

There were attempts to legislate for other profits which woods provided. Bark for example was the subject of various Acts. In 1546<sup>27</sup> the unlawful barking of apple and pear trees was forbidden and in 1563<sup>28</sup> a statute restricted the felling of oak trees suitable for barking to the period from 1 April to 30 June.

# Social and economic aspects

The governing elite were suspicious of those who lived in the forests and sought opportunities, when they could, to reduce them to suitable subjection. Forests were areas which could absorb immigrants and so offered opportunities for colonisation to the land-hungry. People driven out of their own lands, or born landless might be able to squat and grub a living. A forest on good land might be readily turned into a pastoral area when trees were felled.<sup>29</sup> In times like the sixteenth century when the population was rising dramatically, the trickle of people doing so, grew to a flood. As population rose there was increasing demand

for foodstuffs so that the wastes and woodlands were encroached in areas where forests had given shelter to landless labourers and craftsmen. Forest people were seen as lewd barbarian villains. Norden said that 'the people bred amongst woods are naturally more stubborn and uncivil than in the champion [arable and pastoral] countries'. He also said they were 'given to little or no kind of labour, living very hardly with oaten bread, sour whey and goats' milk, dwelling far from any church or chapel and are as ignorant of God or of any civil course of life as the very savages amongst the infidels.' John Aubrey said that they were 'mean people who live lawless, nobody to govern them, they care for nobody, having no dependence on anybody'. Norden noted the many cottages newly built in forests under the permission given by the act for erecting houses near mineral places.

Everywhere by the seventeenth century, the inhabitants of forests were increasing so much that the surveyors feared they would come to violence. New and expanding forest communities were squatters' settlements of scattered hamlets with little or no social hierarchy and a developed sense of freedom. The inhabitants were tenacious of their customs and common rights. They were more willing to migrate, more independent, more willing to defend themselves and to take up new ideas. The settlements became the resorts of cattle drovers, the haunts of vagabonds, gypsies and bandits, and the meeting places of millenarian sects—but they did provide an opportunity to work. The multiplication of such people in forest areas led to the destruction of woods and raised problems of preserving the peace.

The existence of such masterless people was a constant thorn in the flesh of the Government which feared the potential for behaviour which flouted the established rules of property and ownership. The royal forests which were less well policed than private forests suffered the worst depredations. The monarchs were therefore doubly tempted to sell off their rights and to remove certain forests from the rules and regulations of the forest law. Such disafforesting was not a new practice—it began in 13th century. The extent to which woods disappeared as a result varies. The forests of Rossendale and Pendle, disafforested in 1506-7, rapidly lost what trees they had and the deer were killed off as settlement took place. The economic possibilities also attracted landlords to the idea of converting suitable forests to pasture or arable. There were areas ripe for improvement by landlords such as those in Galtres and Pickering forests in Yorkshire. The forest inhabitants inevitably suffered. In 1620 the Council of the North told the Privy Council that the enclosure of the best part of Galtres forest had inflicted great hardship upon the neighbouring poor. This did not deter the monarch. Disafforesting was attractive to subjects who had lands within the forest. So, in 1628 Sir Arthur Ingram entered into an agreement with the king to disafforest the lands within the forest of Galtres.31

# Management of forests

The royal forests were traditionally controlled by two Chief Justices of the Forest—one north and one south of Trent—who allocated the warrants to take wood in the forest.<sup>32</sup> Each forest had a warden, a chief forester<sup>33</sup> and/or a Master of Game who had a Lieutenant and gentlemen keepers. On the legal side were the

verderers who viewed vert and venison, received, enrolled and certified to the justices the attachments by keeper. They judged petty offences, certified that coppices were fit for sale and surveyed repairs. The regarders and preservators viewed the state of the woods at theoretically regular intervals. The tithes due from the forests were still paid, although sometimes in kind. Where it was royal property, monarchs disposed of the timber growing in them. Where forests or parks were associated with palaces and manors, this may have been the job of the clerk of the works, reporting directly to the king.<sup>34</sup>

Enquiries relating to royal forests often ended up in the Exchequer. Some forests were managed by the lesser royal courts, thus Leicester Forest after 1399 was part of the Duchy of Lancashire. Swainmote courts to deal with local offences were held at least two or three times a year and the justices went on forest eyres—judicial circuits—periodically. For the long-established royal forests, the structure theoretically remained unchanged, but as the holding of swainmote courts and forest eyres faded towards the end of the fifteenth century, supervision of the forests seems to have weakened despite periodic attempts to revive it. In 1537 Henry made Cromwell Justice of Forest north of Trent. Between June and September 1539, his deputies held forest eyres in Sherwood, Galtres, Inglewood and elsewhere. The locals were so taken aback that Sir Thomas Wharton, who sat in Cumberland, reported that no court had been held there within the memory of man.

One way of obtaining income, while leaving the costs to others, was to lease the forests out. Henry VII in 1508 leased Exmoor and Neroche to Sir Edmund Carew for life at an annual rent of £46 13s 4d with:

all courts and profits of courts and swainmotes, fines, herbage, pannage and agistment...with licence to hunt the deer, stags and bucks and does with dogs, greyhounds, bows and arrows and other instruments of the chase, providing that at his death there be 100 deer left in the forest of Exmoor and 200 in that of Neroche.

This lease was renewed for 300 years.<sup>36</sup>

Disafforestation and sale was another option. Forests of course were not always wooded but what wood existed was always vulnerable in such circumstances. There was sporadic action in various counties. For example, in 1523 a Commission which inspected Leicester forest reported that it had many deer but few useful trees, although in 1526 nine score trees were cut down in the single area called Leicester Frith. In 1526 an area in the north of the forest was enclosed for pasture cleared and drained.<sup>37</sup>

By James's reign allotments of lands for clearing were made from the King's demesne. Dissafforestation, mainly for conversion to arable, took place under Charles, although there was trouble over the commoners rights. It was an attractive prospect for promoters in the early part of James's reign, and under Charles. The Surveyor-General, who from 1621 was Thomas Fanshawe of Jenkins, was deeply involved in the business of realising the value of the Crown's forest interests, usually by disafforestation, There was a spate of such actions despite much local resistance.<sup>38</sup>

The arrangements for Selwood were typical. The Attorney-General sent the necessary warrants for Neroche, Selwood and Feckenham forests and for the disafforestation of Braydon to the Duke of Buckingham. Selwood was to be divided in three; one part to the Crown, one to forest landowners and one to commoners. The King's part was then sold off to people such as Sir Cornelius Vermuyden. A commission went out of the Exchequer to set out the king's part but the Ranger and keepers maintained by Sir Thomas Russell and Sir William Russell his son, late Masters of Game there—'which office is to become utterly void by the disafforestation'—resisted.<sup>39</sup> In July 1629 Charles granted the forest of Galtres to his creditors in fee farm in consideration of a fine of £20,000. It was divided and enclosed, but the tenants of Alne Tollerton and Newton refused to agree. Dispute continued in 1637 with the lessees of disafforested lands complaining that the people of the adjacent country would not pay any considerable rent for what they say have been their commons. Its land was poor and unmanured. Hunting rights remained important. William Cecil. Earl of Salisbury. and Thomas. Lord Arundell of Wardour, and others fought over the rights and boundaries of Cranborne Chase under James. Charles also offered forests as security for loans. 40 He made over much of the forest of Dean with timber and mines to Sir John Winter for a capital advance.

# Management of Crown woods

The Crown woods, as distinct from forests, were under the control of Surveyors of Woods, separate from the forest management, from the beginning of the 16th century. The area of woods under Crown control grew enormously during that century with the dissolution of the monasteries, most of which had woods and many forest rights as well. No one, however, has ever attempted to calculate the area involved. A rough estimate suggests it must be over 40,000 forest hectares which would still be only a fraction of the total wooded areas.

Income from woods was a small but significant part of the royal revenues, usually 'assigned' to particular activities. From at least 1503 there was a Master responsible for the sale of royal woods. While in theory the Chief Justice still needed to authorise the sale of private woods, in practice new royal grants of woodland were exempted and Crown woods were sold by warrant from whichever court was involved at the time.

Except for the lands under the control of the Duchies of Lancaster and Cornwall, Crown lands including wood sales were managed by men called General Surveyors who were gradually erected into a formal court.<sup>43</sup> A General Surveyor of Woods was appointed in 1521 and two years later woods became a separate office. There were special auditors of wood sales.<sup>44</sup> The costs of wood management were comparatively small being for fencing and guarding coppices, for hedges and for woodwards' wages.

A separate court called Augmentations was set up in 1536 to manage most monastic land. In many counties, the dissolution brought the Crown useful supplies of new wood in poorly wooded areas. An Act provided for regional auditors and receivers to survey woods and determine wood sales.<sup>45</sup> In 1537 William Cowper was made overall Surveyor of Woods with authority to appoint

sufficient deputies. In 1543 the post of Master of Woods was created and Sir Thomas Pope appointed.<sup>46</sup> The court had judicial authority.<sup>47</sup> Revenues from wood sales were included amongst the 'casual' revenues in the accounts of the Treasurer.<sup>48</sup> The court had administrative responsibility for the bureaucratic management of sales, but decisions on sales of woods were usually disposed of by the King and Council.<sup>49</sup>

In 1546 the courts of General Surveyors and Augmentions were amalgamated into a new Court of Augmentations. In this court the forest division of lands north and south of Trent was adopted. There was a central Surveyor of Woods and a Master of Woods in each district. They were to determine 'what woods are mete to be solde' and upon certification of the Surveyors of Woods and by the advice of the Chancellor and General Surveyors to conclude all sales of 'underwoodes and coppice woodes' within the survey of the court. The surveyors were to make periodic surveys filing the written results. The second court was soon also under fire for being too costly. In 1552 it was suggested that Augmentations could shed amongst others the two Masters of the Woods, the two Surveyors, forty-four particular surveyors and thirty-six woodwards.

In 1554 the Court of Augmentations was abolished and Crown lands were put under the management of the Exchequer. The implementation of the amalgamation of the two courts went on over a number of years. Policy was the responsibility of the Privy Council but there was substantial disagreement about the administrative structure. Some thought that woods and underwoods should not be leased, while others stressed the value of certainty—there would be no unexpected charges, no fees to be paid and the money could be paid directly into the Exchequer. Woods were managed by Surveyors-General of Woods, Forests, Parks and Chases. 53 Eventually a new development established that those responsible for wood sales were also to account before the auditor, bringing wood sales into the ordinary process—where it could be checked by the further requirement that court rolls should include a note of wood sales.<sup>54</sup> Receipts were to be paid to the local receiver. The Augmentations practice of local officials being made responsible for the provision and sale of fuel and timber, the payment of fees and for authorising repairs was continued under Exchequer rule. 55 Commissioners attempted to recover money for spoil of woods which were not insubstantial amounts 56

General surveys of woods in the forests and of the management of the forests were periodically held by special commission from the Exchequer. In 1567-8 it was decided that all agreements for sales of the monarch's woods were to be made by commission under the Exchequer seal. Crown woods were sold by Exchequer warrant and forests offenders prosecuted in Exchequer. Eventually, by the 1580s the sale of wood was authorised only upon warrant signed by the Chancellor and Under-Treasurer or by the Lord Treasurer.

The administrative situation was complex and led to inevitable disputes. The conflict of jurisdictions was hard to resolve. The Chief Justice of the Forest was concerned with game and covert, the Surveyor-General with the inheritance and profit of the Crown.<sup>57</sup> Individuals had rights of various sorts within both woods

and forests which resulted in disputes which had to be resolved. Disputes over forest estates which were in Crown control and over boundaries were often handled by special commission from the Exchequer and lawsuits proceeded by Exchequer bill. Fines for woods were the result of prosecution through the Queen's Remembrancer in which the Attorney-General was the formal prosecutor and the Surveyor, the informer. 58

W.C. Richardson, in Tudor Chamber Administration, said that the Woods Office was part of a comprehensive program for the more efficient administration of the woodland and national forests of England.<sup>59</sup> The existence of a program may be doubted and, if it had ever been envisaged, it must be deemed a failure. Any abstract policy in the period was rapidly undermined by the granting of exemptions and the ill-defined concession of rights to favourites. The Tudors, perennially strapped for cash, kept the more influential of their subjects sweet by granting them extensive and unsupervised powers in areas where efficient bureaucratic government would be unpopular with all concerned. They thus deflected grievances from themselves to the patentees and others who might periodically be brought to account either by a lawsuit brought by other aggrieved subjects or by a special commission of enquiry. They granted the right to fell timber with no reference to the availability of timber to be cut, so that several individuals might be left squabbling over what there was and the area might be disastrously denuded. The occasional fines which such spoilers might have to pay (or which as a further favour they might eventually get remitted) were probably far less than the profits made. The management structure for the woods was never properly thought through and various attempts to centralise and produce an overview were never wholly successful. It was also undermined by the Crown's large-scale disposal of monastic lands including woods. In many places the woods were immediately stripped by the purchasers and their servants.<sup>60</sup>

Each time there was a restructuring of the courts, new efforts were made to improve royal control over local exploitation. Crown woods, however, were an attractive prey for potential entrepreneurs who had no motivation to preserve them. The Exchequer special commissions are full of presentments and depositions as to the spoil of Crown woods.

# Revenues from woods

No one has calculated what the ordinary revenues from woods were. The fact that on royal warrant sizeable amounts of timber was cut for the direct use of the king's works, or by gift to others, means that figures for sales are an unknown percentage of real revenue anyway. Contemporary attempts to establish the exact state of the sales and purchases were usually undertaken in crisis circumstances and are dubiously typical. In what is allegedly a comprehensive general account in 1546, sales of timber brought in about £2,000 but this is unlikely to be complete. Moreover the royal practice of making gifts of wood removes the true monetary value from the accounts. In 1592 someone offered to farm all the Queen's woods for £20,000. Lord Howard of Effingham, who later became chief Justice of Forest

south of Trent, objected that there were 180 parks, forests and chases and the rights to be leased were worth far more than £40,000 a year. 61 Moreover, the monarch had an increasing need for timber for shipbuilding, and the value of timber cut for these purposes is not factored into the accounts.

By 1606-9 there were estimates of actual receipts of £8,645 per annum gross, possibly only a small proportion of the true commercial value. Total monetary income from woods, however, probably did not exceed £10,000. Where Crown woods were leased, the rents could easily slip into arrears. Revenue commissioners from 1607 recommended the sale of woods as there was no general shortage of wood

Fines could significantly increase this yield. From 1604 Otho Nicholson and other commissioners inquired into new arable clearings in forests or commons (assart lands). They reclaimed fines and annual rents and took proceedings in Exchequer against recalcitrants. By 1616 over £25,000 had been raised or some £2,000 to £3,000 a year. In 1612 the capital value of Crown wood reserves was said to be perhaps £403,000 or less than a year's ordinary income for the monarch. The attraction of raising lump sums from sales increased as royal needs became more urgent. By the 1620s the intention was to 'raise great revenues for the Crown' from forests, parks and chases and by exploiting manors. Optimistic figures were floated. The Attorney-General, Sir Robert Heath, suggested in 1626 that £150,000 a year might be obtained by improving agriculture, selling lands gained from draining the Fens, and by disafforesting distant forests. Claiming the extended boundaries of earlier times increased the potential.

Another attraction was enforcing heavy fines for breaches of forest regulations. Even courtiers such as John Hibbons were heavily fined for exceeding the terms of their grants; in 1629-34 he had cut down 4,000 oak trees worth £1 a piece, spoiled coppices and enclosed 38 hectares without warrant. Sir Basil Brooke of Madeley and George Mynne of London held the monopoly of the sale of wood to make iron in Dean and were sentenced to pay £59,039 16s 8d for encroachments and unlawful destruction of covert. Forest courts were revived and the Forest Law vigorously prosecuted by Solicitor-General Noy and others. The poor were charged with poaching with dogs, nets, crossbows, guns and other engines.

In sum, the woods played an important part in the royal struggle to avoid bankruptcy, but their ecological well-being was frequently sacrificed in the process.

# **Ecological impact**

Whether or not there was a shortage of wood, there were divergent and conflicting interests between those with rights of pannage and herbage, commoners with rights to certain forest products—estovers—and to agist grazing animals at certain times of the year, timber workers of all sorts, iron and other smelters, and the navy. A problem was that the conservation and production of timber required enclosure of open forest wastes after felling to protect the young shoots, but this was bitterly resisted where there were miners. Local resistance could be great, as in 1591 in Dean when the locals refused to cooperate with timber cutting and

threatened the foreigners who were imported to do so with death and injury.<sup>65</sup> All of this was aggravated when the monarch made generous gifts of timber trees and underwood to favourites without a proper survey of the trees, so that competing royal warrant holders could strip the whole of particular areas.

This was not the surveyors fault. They knew their job and periodically made sensible recommendations for the management of the woods. Roger Taverner. Elizabeth's Surveyor-General of Woods in the south, claimed in 1563 that things were better ordered in the time of the Court of Augmentations and that wood should be cut at twenty years. He also promoted the idea that forest offences should be policed more rigorously and fines imposed to increase the Queen's revenue. This was the beginning of a six-year period of intense concern for wood. an increase in wood sales and concern for coppicing. Most of the woods were either coppiced or pollarded. Their use on a routine basis—sales of coppices for fences and so on-would bring a steady and renewable return. While Richard Taverner was the most eloquent of promoters of good forestry practice he and his son, John, were not alone in their ideas. Other surveyors, like Sir Francis Jobson, although less vocal, had the same principles. 66 However, their recommendations tended to fall on deaf royal ears where Crown estates were concerned as shortterm profit was promised by other means. The foresters' proposals for rotation and thinning to produce a steady annual yield from wood and timber was neglected. Part of the reason for this was the absence of a steady annual market demand for the product. A conscious effort was made early in James I's reign to produce coppices for quick sales, but it was met with a shortage of buyers; only 6000 of the 16,000 to 20,000 hectares of coppice surveyed had been let by August 1612. Only some 3764 hectares were let which produced an income of only £3157. The monarch turned to more short-term expedients. As a result, excessive waste was common.

This sort of depredation was more prevalent in some areas than others because the local demand for wood varied. The desirability of the woods depended on their location and the closeness of navigable water. Northamptonshire forests, Rockingham, Salcey and Whittlewood were too far from water to make their wood attractive to any but locals in the sixteenth century. The areas under pressure were mainly in the south and near water. Delamere evidently remained untouched until the later 17th century. In estimating his profits from the forest in 1626 John Done said that there had not been any crop of trees for many years. In 1622 Webb said it had:

...no small store of deer, both red and fallow; plenty of pasture in the vales, wood upon the hills, fen and heath in the plais, great store of fish and fowl in the meres, pewits or sea mawes in the flashes and both kinds of turf for fuel upon the highest hill a delicate tower (the Chamber) for the chief forester himself and disposed on everyside of the said forest, pretty and handsome lodgings for the keepers in each walk. 69

The forest of Dean was similarly protected by distance for most of the 16th century until the destruction of forests nearer to London and the south-east saw a sudden surge in naval interest and the upgrading of the local iron works.<sup>70</sup>

Numerous surveys and inquisitions about iron works, spoil and the office of the woodward show where the pressures were. Failure to maintain standells of timber trees and to protect the undergrowth from the foraging of animals led to an overall degradation of the quality of the forest land. Part of the mismanagement is generally thought to be lax administration. The Crown failed to use its reserved grazing rights so that the locals used resources which were not legally theirs, grazing their cattle on deer preserves and cutting wood.

Part of the problem was that the 'presentation of those who spoil the King's woods is so chargeable and tedious that it undoeth those who follow those suites; needs to be reviewed; the prosecution of the King's debts needs to be speeded up and books of rates to be observed'. Demand for timber varied considerably from area to area. Areas close to London and the sea, like Kent and Sussex, were under heavy pressure for timber and woodwards in such places were likely to be tempted to turn a blind eye to some actions. Spoils in Kent were numerous.

There was a steady if slow erosion of forest land which was turned over to other uses. When Paget land fell into royal hands, Sir Fulk Greville who obtained a lease, felled 948 of the total 1264 hectares and used the land for sheep farming despite an inquiry in 1600.<sup>72</sup>

John Norden in his Surveyors Dialogue printed in 1610 said that much timber was felled in the country. Some districts in the west midlands and the south and central lowlands of Lancashire show a transformation from forest to pasture or mixed arable and pasture. Woodland or arden land became champion or felden (field land) country. In some places the conversion produced fertile country. Elsewhere, unsuitable land was cleared and found useless.

One can only conclude that the Crown does not appear to have managed its own woods sensibly and efficiently or prevented their reduction to heaths or farm land and that the ecological consequences in some places were considerable.

#### **Notes**

There is a great deal of manuscript material for the history of forests and the separate history of royal woodlands. It is scattered across a wide range of classes in the Public Record Office as well as the materials in the British Library manuscript collections and local record offices. Too many of these have been used for this paper to make detailed footnotes either useful or practical. When local issues became a matter of policy, letters may crop up in the Calendars of State Papers or in the manuscript collections of the great ministers like Sir William Cecil, Robert Cecil and others. In the course of administrative reorganisation, the public records which were once the responsibility of different courts are now to be found principally in the Exchequer collections, although some are still under the Duchy of Lancaster (DL) and Duchy of Cornwall collections. In the Exchequer, there is woodland material in most of the land revenue accounts. whether 'ministers' or 'receivers' accounts, and some in the central treasurers accounts in the various pre-1554 courts. There is also material in the auditors collections. The courts commonly handled specific problems by issuing commissions to prominent local leaders to enquire and report. These special commissions are catalogued by county and year and the cases relating to woodland and forest can be identified by the short titles.

#### Jack-Royal forests

The Exchequer decisions are sometimes recorded on the Remembrancers Rolls which were the main repository for formal court decisions in revenue matters.

- R.A. Dodgson and R.A. Butlin (eds.) 1978. Historical Geography of England and Wales. London: Academic Press, 2nd edn; W.G. Hoskins 1967. Fieldwork in Local History. London: Faber and Faber London: 51-4; M.W. Flinn, Timber and the Advance of Technology: A reconsideration. Annals of Science 15: 109-120; G. Hammersley 1957. The Crown Woods and their exploitation in the sixteenth and seventeenth Centuries. Bulletin of the Institute of Historical Research XXX: 136-61; Joan Thirsk (ed) 1967. The Agrarian History of England and Wales. vol. IV; W.C. Richardson 1961. History of the Court of Augmentations 1536-1554, Baton Rouge: Louisiana State University Press; V.T.T. Skipp 1978. Crisis and Development: An ecological case Study of the Forest of Arden 1570-1674. Cambridge University Press; J.U. Nef 1932. The Rise of the British Coal Industry. vol 1: 161.
- 2 J.U Nef, op. cit.
- 3 M.W. Flinn, op. cit.
- 4 Brinley Thomas. Was there an energy Crisis in Great Britain in the 17th century. Explorations in Economic History 23: 124-52.
- 5 For estate matters see R.W. Hoyle (ed) 1992. The Estates of the English Crown 1558-1640. Cambridge University Press.
- 6 see G.F. Farnham Charnwood Forest and its Historians; L. Fox and P. Russell. Leicester Forest, in Leicestershire, Victoria County History v. 2: 265ff.
- 7 G. Hammersley 1973. The charcoal industry and its fuel 1540-1750. Economic History Review, New series. 26: 593-613 at 606.
- 8 Joan Thirsk. op. cit. vol IV: 36-8 and elsewhere.
- 9 For a good brief account see R. Whitlock 1979. Historic Forests of England. Moonraker Press.
- 10 Michael Parsons 1995. *The Royal Forest of Pancet*, Monograph on local history of some parishes on the borders of SE Wiltshire and Hampshire. Pub. Leonard Michael Parsons (2 Walnut Close, New Milton, Hampshire): 2-3.
- 11 F. A. Latham (ed) 1991. Delamere. Whitchurch, Shropshire: 28-9.
- 12 R. Whitlock 1979. Historic Forests of England. Moonraker Press: 27.
- 13 O. Rackham 1986. The history of the countryside. London: J.M. Dent.
- 14 H.R.Schubert 1957. History of the British Iron and Steel Industry from c 450 BC to AD 1775. London: Routlege and Kegan Paul: 222.
- 15 W. Schlich 1906. Manual of Forestry Vol 1 Forest policy in the British Empire. London: Bradbury Agnew (3rd edn.): 45.
- 16 Schlich, who was the foundation Professor of the forestry school established in Britain in 1881, calculated that one labourer was needed for every 20 acres [8 ha] so that if 300,000 acres [121,000 ha] a year could be added to British stocks employment would be found for 15,000 labourers. If well managed, thinned after a period and cropped in rotation, Schlich had no doubt that Britain could become significantly more self-supporting in timber. This was probably the low point of woodland in Britain. See Chapter 9, this volume.
- 17 G. Hammersley op cit.
- 18 See R.G. Albion 1926. Forests and Seapower: The timber problem of the Royal Navy, 1652-1862. Cambridge, Mass: Harvard University Press.
- 19 J. Drewett and J. Roberts. 1994. Midland Woods and Forests. Birmingham: Queercus: 76.
- 20 Arthur Standish, Gabriel Plattes, Samuel Hartlib, Walter Blithe, Sylvanus Taylor John Smith, Andrew Yarranton, Roger Coke, John Evelyn, William Petty, Robert Hooke, Nehemiah Grew, John Worlidge and John Houghton—see L.Sharp. Timber, Science and Economic Reform in the Seventeenth century. Forestry 48: 51-86.
- 21 M.L. Zell 1985. A Wood-Pasture Agrarian Regime: The Kentish Weald in the Sixteenth Century. Southern History: A Review of the History of Southern England 7: 69-93 says

#### Conserving

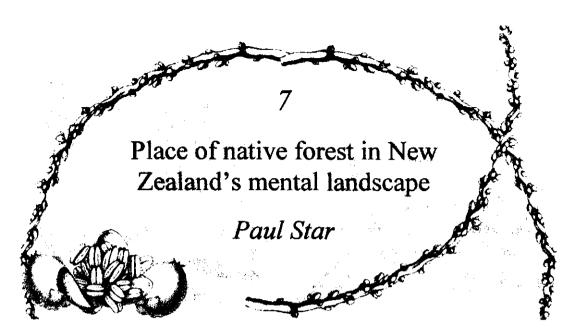
remarkably little about the wood management of the area—concentrating on the number of cattle in inventories.

- 22 J. Drewett and J. Roberts op. cit. 26-7.
- 23 The issue of hunting dominated forest law in Henry VIII and Edward's reign. The statutes of 31 Henry VIII dealt with wrongful entry into any forest park or chase of His Majesty, the Queen, the Princesses or any of his Highness' children. That of 32 Henry VIII included sections on the wrongful taking of deer. An experiment at the beginning of Edward's reign relaxing the rules had been a failure, and the Act 2&3 Edward VI in its preamble claimed that the unlawful hunting that had followed saw the slaughter of 500 deer in a day within a very few miles of London. The Free Pardon in the same session explicitly exempted from the pardon 'all ma[s]ters of Kings woods in any of his forests, parks, chases and elsewhere'.
- 24 Henry VII tried to restore order in the forests, an Act 1 Henry VII claiming that 'som with paynted faces, som with Visors and otherwise disguised had hunted and that they whould be punished as felons for hunting by night'.
- 25 Rastall. A collection of Statutes [British Library 505 G10] 581a. For leaving a quarter of the grounds for the use of the tenants and inhabitants and if they not assent to the allowance then two Justices of the Peace with no interest in the area should oversee this and get it approved in open quarter sessions. The cutting must take place within four months of the settlement or the commoners could resume access. There was a provision that it should not be prejudicial to lords in the weald of Kent, Surrey and Sussex. This act was evidently a success as it was renewed in successive Parliaments and eventually, in 13 Elizabeth, made perpetual.
- 26 23 Elizabeth c 5 and 27 Eliz c 19 confirmed these intentions.
- 27 37 Henry VIII
- 28 5 Elizabeth c 8 concerning the barking of trees
- 29 Joan Thirsk (ed) 1967. The Agrarian History of England and Wales v 4: 99-101.
- 30 J. Norden. The Surveyors Dialogue: 215.
- 31 Calendar of State Papers, Domestic 1628-9: 477, 569.
- 32 Samuel Rowe (first published 1848, revised and enlarged 1896, facsimile 1985) A perambulation of the Ancient and Royal Forest of Dartmoor and the Venville Precincts: 264.
- 33 An act of 32 Henry VIII legalised the appointment of deputy justices.
- 34 Michael Parsons op cit: 21-4 refers to some of these problems but does not solve them, nor explain how the woods of the old regard became private preserves.
- 35 Strictly, an 'eyre' is a perambulation but the word became used for judges going in circuits to hear cases at certain fixed points. Henry VII ordered a series of eyres and swainmotes shortly after his accession. E.g. Swainmotes were held in southern forests—Melchet, Meksham, and Pewsham, Gillingham, Bernwood and Waltham and in Windsor forest. R.K.J. Grant 1991. The Royal Forests of England. Alan Sutton: ch. 13.
- 36 ibid. 183
- 37 Leicestershire Victoria County History, v. 2: 265ff.
- 38 Calendar of State Papers, Domestic, 1625-6: 496, 546-7.
- 39 Historic Manuscripts Commission. Cowper I: 457, 461, 472.
- 40 Ralph Whitlock 1979. Historic Forests of England. Moonraker Press: 30.
- 41 Note that the forest acre was larger than the ordinary acre—120 to the 100.
- 42 In 1565 Richard Taverner completed a survey which was preserved in the Exchequer in which he recorded and roughly described the woods in the twenty counties for which he was responsible. There were 53,000 acres [21,450 ha] of Crown wood (presumably forest acres) 9980 [4039 ha] in Dean. Double this for the area North of Trent. Given that England and Wales covers 15M ha and in 1931-3 1.3M ha of Great Britain (including Scotland 22.8M ha in all) were forest and wood. L.Dudley Stamp 1962. The Land of Britain: its Use and Misuse. Longmans.
- 43 S.R. Gardner (ed.) Letters and Papers of Henry VIII. v. 1: 1602.

- 44 In 1523-4 yet another reorganisation was in hand which left woodsales to general surveyors. In 1542 John Mynne (an auditor) was described as the surveyor general's clerk and master of the king's wood sales. British Museum, Stowe 554 f 42d.
- 45 W.C. Richardson op cit: 47.
- 46 Sir Thomas Pope had been Treasurer to 1540. In June 1544 David Clayton (d 1546) joined him in the office. He was succeeded by Geoffrey Gates who was a woods official in the new court; an extra auditor was also appointed in 1543 Griffin Tyndale and special receivership Walter Farr. In 1545 John Perte was appointed as Tyndale's assistant. W.C.Richardson op cit: 108-10.
- 47 Which was evidently delegated in matters involving fines under £40 to the surveyors while more serious matters were referred to the master who exercised delegated authority by the will of the chancellor and in the second court the general surveyors. W.C.Richardson op cit: 304.
- 48 ibid: 201.
- 49 ibid: 217.
- 50 John Arscot (d. 1558) who was a barrister by profession was Surveyor North of Trent, and Robert Heneage who was Master of Woods in General Surveyors by 1546 was Master South of Trent. Geoffrey Gates (d. 1550) was Surveyor, succeeded by Sir Francis Jobson of Colchester, formerly a particular receiver, and Thomas Pope was Master—a position he ceded in 1549 to Sir John York. *ibid*: 220, 304-5.
- 51 The local woodwards were required to advertise the sale in the parish and the nearest market town. 'Provided alway that they make no sales of any Oke likely to serue for tymbre without our specyall warraunt'. *ibid*: 303.
- 52 Receipts were the responsibility of the woodwards who paid the moneys to the county receiver. In the royal forests woods could only be sold with the approval of the justices of the forests and notice to the local keepers.
- 53 A commission dated November 1555 investigated all sums still due to the Crown for sales of plate, jewels, lead, bell metal and timber made since February 1536. W.C.Richardson op. cit: 264, n 60.
- 54 These accounts were always difficult and the solutions found were not satisfactory.
- 55 In 1555 Sir John Yorke as General Surveyor of Woods in Augmentations exhibited three paper books of wood sales covering most of Edward VI's reign (1547-1553).
- 56 J. Arscott for the woods beyond Trent alleged £700 of spoils.
- 57 See R.G. Albion, op.cit.
- 58 They can be found in the tellers records.
- 59 W.C.Richardson, Tudor Chamber Administration 1485-1547: 259-73.
- 60 J. Drewett and J. Roberts op.cit: 41-2 discussing Needwood.
- 61 Leasing the herbage and pannage, he said, would disturb the deer. The lease would be used as a pretext for the wholesale felling of timber. The suggestion that disputes should be referred to the Lord Treasurer, the Chancellor and the Court of Exchequer was an unwarrantable encroachment upon the jurisdiction of the Forest Justices in Eyre. He prevailed. Calendar of State Papers, Domestic, 1595-97: 438.
- 62 Historic Manuscripts Commission. Cowper I: 294.
- 63 The Long Parliament restored the boundaries to those commonly reputed in 20 James I. In 1653 an act was passed for the disafforestation, sale and improvement of Royal Forest but it proved ineffective. Reign of Charles II saw end of Forest courts. Surveyors general of woods and forests continued to do the work of managing the woods.
- 64 Grant op.cit: 194
- 65 C. E. Hart 1966. Royal Forest: A history of Dean's woods as producers of timber. Oxford: Clarendon: 81-2.
- 66 W.C.Richardson. Tudor Chamber Administration: 260

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- 67 P.A.J.Pettit 1968. Royal Forests of Northamptonshire a study in their economy 1558-1714. Northants Record Society.
- 68 F.A. Latham op.cit: 38.
- 69 ibid: 37.
- 70 C. E. Hart op cit: 83-5.
- 71 British Museum, Lansdowne 40: 433 [446]
- 72 J. Drewett and J. Roberts op.cit: 26.



## Introduction

In 1864, George Perkins Marsh published Man and Nature. 'Here were the first stirrings of environmental awareness and the conservation movement, as it became known in the Western world. It started in America and it started in the forest.' So wrote the eminent historical geographer, Michael Williams, in 1989.1 Such a statement has become controversial, following Richard Grove's investigations into the far longer history of forest conservation in the French and British Empires.<sup>2</sup> We are now more aware of the conservation movement's pedigree outside America. But I think we must also question the nature and the closeness of the link between forest conservation and the emergence of environmental awareness. I do so by focussing on attitudes to New Zealand's native forests ten years after the publication of Marsh's book. International forest historians have neglected the New Zealand case. Even in Australia, reference is often only made to other imperial parallels or to America.<sup>3</sup> Nevertheless, there is obviously some relationship between Marsh's writings, Australian forestry reports in the 1870s, and Julius Vogel's 1874 speech in the New Zealand House of Representatives introducing his Forests Bill, in which he refers to these influences. I examine the New Zealand situation specifically in 1874, when forests were widely discussed. I have used not only the parliamentary evidence, which has been the subject of earlier analyses, but also previously untapped material in New Zealand's provincial newspapers.

Statistics available at the time charted the rapid expansion of the European population of the colony, with its implication of new needs to be met. There were one hundred thousand European New Zealanders in 1861, three hundred thousand by 1874. When they debated the forest resource, members also had in mind

figures relevant to long-term timber supply. New Zealand had over 20 million acres [8 million ha] of forest in 1830. By 1873 it was down to an estimated 12.63 million acres [5.1 million ha]. This information was tabled by the Prime Minister, Vogel, at the start of debate on his Forests Bill. The figures were disputed, but no-one doubted the destruction of a great deal of forest, and some argued for a need to conserve part of what remained. Such conservation implied a wise use of the resource, ensuring that the supply of timber from native forests could be maintained. Timber was necessary for props in mining, for railway sleepers and for fences on farms. It also had value as fuel in a colony with uncertain coal resources, and for housing in a society where other materials were often unavailable or unappreciated.

## The native timber industry in 1874

'The habit of many of our colonists to...undervalue the quality of our native woods' was still commented on in 1874, but awareness of their economic worth had in fact grown considerably. In Auckland Province, about twelve hundred men found direct employment in the timber trade. At the other end of the country, in Southland, eighteen mills employed 220 men and supported perhaps a thousand people in all.

The industry had also reached take-off point in the forests above Wellington. The first mill in Palmerston North only commenced operations in 1873, but in 1874 at least seven new mills opened in the region. Elsewhere, the timber trade was considered to have tremendous export potential, with much talk of the 'immense and almost inexhaustible forests of splendid timber growing throughout Westland'. 6

# Responses to the exploitation of native timber

Response to these developments was twofold. On the one hand, some worried that it would lead to exhaustion of supply. They demanded conservation, to ensure a long term future both for the industry and for its raw material, the forest. On the other hand, opponents of conservation saw this as an inappropriate restriction of enterprise. They saw no shortage. One calculation indicated that Southland alone had enough timber to last four centuries.

Another school of thought accepted the economic potential of timber in general, but argued that native forest was a poor place to grow it. Thus, even though the supply of native timber was finite, there was still every reason to dispose of it. Settlers were urged to 'utilize with all possible despatch existing forests, and replace them by the cultivation of [exotic] trees'. Since plantation was a more concentrated investment than native forest, this meant that 'a large quantity of bush land will year by year be available for agricultural purposes'.

There were deeper considerations at work here than the future of the timber industry or of supply. The Superintendent of Nelson thought 'it would not be practicable to take steps for the preservation of timber...without injuriously affecting the progress of the settlement of the country'. It was but a small step

from this to see forest and settlement as diametrically opposed. Such a stark analysis had every appearance of truth to many West Coasters. 'To cultivate the soil,' they said, 'it is necessary to clear the land, and if obstructions are placed in the way of doing this, the settlement will not present a very lively appearance'. It followed that 'a bush fire that would destroy a few million pounds worth of timber would be a blessing'.<sup>9</sup>

Primary New Zealand sources do, therefore, confirm the opposition between European settlement and colonial forest which historians have frequently described. It is the thrust of this paper, however, that at least by 1874 we in fact find a complex picture which cannot be described simply in terms of such an opposition.

# Attitudes to forest at the provincial level

Concentration by historians on forest legislation at the national level - on Vogel's Bill and the small amount of parliamentary debate on forests in the six years preceding it—has taken attention away from independent activity in the provinces. Such local activity had greater immediate consequence, particularly in Otago, and indicates a more home-grown response to the forest question than the Forests Bill, which was inspired more directly by international precedent.

At the provincial level, two distinct policies which sought to ensure a long-term supply of timber were already in place: encouragement of exotic plantation on the one hand, and regulation of native forest exploitation on the other. A third policy, that of native forest conservation by protection and replanting, was subject to some scepticism and received little public support.

# Provincial encouragement of exotic plantation

Even before Vogel championed an active state involvement in forestry, Canterbury and Otago Provinces (with 53 per cent of New Zealand's European population between them) were already so engaged. The Forest Tree Planting Encouragement Act of 1871 was an initiative from Canterbury which granted two acres of Crown land for every acre a landowner planted in forest trees. Exotics, such as Californian pines, were the kind of trees intended. Under the Otago Waste Lands Act 1872, licences to unforested wasteland were granted for a probationary period. The completion of fencing and planting in approved forest trees entitled the licensee to a Crown grant for the land.

A related initiative, to improve the availability of exotic seed and seedlings for plantation, found support at both the national and provincial level. The Government's Botanic Gardens distributed American forest tree seed throughout New Zealand and acclimatisation societies, sponsored by provincial government, experimented in the same way. Private enterprise was also promoting plantation. Nurserymen stocked a wide variety of exotic seedlings. James Cooper of Invercargill, for instance, had several thousand two-year old pines for sale, most of them American species.

After offering tree-planters rewards of government land, government seed, and government seedlings, it was a logical next step for provincial governments themselves to plant exotics on public land which they intended to retain. Some thought 'every Road Board district should have its 20 or 30 acres [8 or 12 ha] of public plantations'. Already, in 1873, 13,000 young trees had been planted by the Canterbury provincial government beside the railway line north of Christchurch. In Auckland, the local Highway Board requested £500 from the Provincial Council for 'planting...Mount Eden with forest trees and shrubs'. 11

Various motives intersected in these examples. While the plantation of a rural block of land was generally done with timber supply and eventual economic gain in mind, tree-planting close to or within the urban environment was undertaken more for social gain. Health, beauty and recreation, as well as erosion and shelter, became factors.

We can see here the beginnings of civic pride, but no expression of the national pride of twenty or thirty years later. And while, with nationalism, interest grew in native tree species unique to the New Zealand bush, in 1874 exotics were planted almost exclusively.

# Provincial regulation of native forest exploitation

Parallel with this came a tightening of control on the exploitation of native forest, even in provinces which were still heavily timbered. In March 1874, 'to stop to some extent the wholesale destruction of timber going on in the forests of the province', the Auckland Provincial Government temporarily withdrew all licences for cutting timber on public lands.<sup>12</sup> Even Westland set aside timber reserves for mining purposes.

The practices of shingle and post splitters were widely criticised. An Auckland correspondent found it 'painful in the extreme to witness the frightful waste and destruction which this practice is causing'. Duncan McArthur, the Inspector of Forests for Southland, abhorred the activities of splitters who scoured the forests for suitable trees, cutting then rejecting those which were not 'even-threaded'. He wanted millers, not splitters, licensed to produce fencing material, since they wasted much less. The ranger at Queenstown felt that 'timber has been used in this country as if trees spring up like mushrooms'. In response to such criticism, the Otago Waste Lands Board classified much of the available forest as 'sawmill bush'. Manual wood-cutters could then only operate in designated areas, each no more than three acres [1.2 ha] large and away from the saw-mills.

When the government surveyor, soon after 1868, gathered evidence of the rapid destruction of native forest, he 'concluded that the more valuable timber was best conserved by the sale to private individuals of the land which bore it'. Although this was 'the prevalent opinion on the subject at the date it was collected', by 1874 it was 'no longer held so generally'. Impressed by the Waste Lands Board's new stringency, many changed their opinion of state action. The *Otago Daily Times* had previously 'advocated the alienation of the bush lands...as the only proper cure for the waste and destruction'. Now they had 'every confidence that...[the Board] will hinder waste and stay the destruction in our timbered land without parting with the freehold'.<sup>14</sup>

#### Provincial conservation of native forest

Though the Board wished to control exploitation of native forest, long-term they looked to plantation rather than conservation. But what of a third policy, anticipating a long-term productive future for the bush as 'a source of perpetual wealth and comfort to the inhabitants of the country'? Duncan McArthur's vision, at least, was one of the sustainable logging of native forests. Southland's beech forests contained a great deal of timber less than a foot [0.3 m] in diameter, which was abandoned, but McArthur thought 'every hundred acres [41 ha] gone over by the saw-miller ought, as in Scotland, to be fenced, to prevent cattle destroying the saplings'. 15

He had his supporters, including Vogel and some newspaper columnists, but others found his ideas 'sublimely ridiculous. What is there to protect?' The absence of any official encouragement for McArthur to experiment with native forest conservation is in striking contrast with the encouragement of exotic plantation.

The advantage of 'full grown artificial plantations', to the Otago Waste Lands Board, was that 'every single tree could be turned into prepared stuff, not one nineteenth only, as is the case with the natural growth'. It was suggested that with native bush (other than kauri forest), 'instead of a collection of stately trees we have in fact a mass of tangled woodland in which the greater part is useless'. 17

Further, there was a belief that native forest, once touched, could not thrive. Even Edward Stafford, a supporter of conservation, agreed that 'there is nothing so difficult as to use, and at the same time to maintain, indigenous forests'. For some, bush was so strongly representative of everything settlement sought to replace that any experimentation with it was intrinsically less acceptable than planting exotics in the same space.

# Forest conservation and plantation by central government

The effectiveness of the Otago Waste Lands Board's strategy paved the way for the state control of forests on a grander scale. The *Otago Daily Times* continued to praise the efforts of the Board, but remarked that they were:

necessarily rather in the way of regulating the destruction of our forests than conserving them...only from a comprehensive scheme, such as the Premier has now launched, can actually profitable and permanent results be expected.<sup>19</sup>

The initiation in New Zealand of a policy of forest conservation at the national level came from Vogel. His Bill proposed that Government provide £10,000 a year, for ten years, to conserve native bush and plant new forests. A commissioner of forests would select up to three per cent of the public land of each province, to be administered by central government for conservation and plantation. Vogel felt that timber from this land would yield a healthy and sustainable profit for the state, which could be used in the development of New Zealand's railways. Intense parliamentary opposition resulted in amendment of the Bill,

making the provinces' transfer of public land to central government a voluntary procedure. It then received a more sympathetic hearing, and passed into law.

There is a tendency to think that forest conservation in New Zealand took a premature leap forward when Vogel championed it, that the force of his personality gave birth to legislation which most found unnecessary or irrelevant. The subsequent failure by other premiers to provide financial support for the legislation, and the reactivation of interest in state forestry only upon Vogel's return to power in 1884, appear to support this line of thinking. But moves to control exploitation were already underway throughout New Zealand in 1874, with or without Vogel.

The situation could be analysed in terms of the political model applied by Stephen Legg to Australian forest policy in the same period. <sup>20</sup> Vogel's initiative came at a time when many barriers to change, in the shape of ideological differences and procedural obstacles, had already been overcome. His Act did not have the effect he hoped for, because it did not surmount two remaining barriers: it was neutralised by the modification of its clauses, and, even then, it was not enforced.

The solutions which eventually emerged did indeed lie with state forestry controlled at the national level. However, Vogel's attempt to foist this on an unsympathetic general public in 1874, and in particular to mix it with ideas of debt payment and centrist aggrandisement, cast suspicion on forest conservation and may even have set back its development.

## Parliamentarians' attitudes to forest and conservation

In the parliamentary debates of July and August, a wide range of opinions about native forest found expression. Analysis of the parliamentary evidence gives a further idea of the range of attitudes to the forest in the 1870s, and sets the views of individuals, including Vogel, in their social context.<sup>21</sup> By displaying the mental landscape of society at this time, we reach a greater understanding of the simultaneous destruction and conservation of the indigenous environment—tremendous change in the total physical landscape—which followed. The spectrum of parliamentary opinion ranged between a posited extreme belief in forest conservation for its intrinsic worth to, at the other end, a view of its intrinsic harm.

#### Arguments for conservation

If male colonists in the 1870s found native forest beautiful, their representatives did not consider it politic to mention this in Parliament. Vogel spoke of 'its beauty, its healthfulness, and its pleasure-bestowing qualities', but elsewhere in the debate there was virtually no expression of an aesthetic argument. Yet, from extra-Parliamentary evidence, we may confidently state that some colonists did see beauty in the bush in 1874. Even opponents of conservation acknowledged this. 'A forest may be more beautiful than open land', said one, 'but most people would prefer the open with flocks and herds depasturing thereon'. 22

The sanitary argument—that forests could make for healthy minds and bodies, not just a healthy climate—did not feature in the debate, save in the phrase from

Vogel just quoted. There is evidence elsewhere of an early awareness of the tourist or recreational potential of native forest, for its scenic value. No-one doubted the aesthetic qualities of forest scenery in Milford Sound, for instance. But this argument (which is essentially economic) also went unmentioned in Parliament.

Similarly, the debate failed to produce a full moral argument for forest conservation and no-one offered a religious rationale. In a speech in Dunedin in January, however, Vogel had claimed it was 'against the most sacred laws of God to allow these grand works of Nature, the trees of the forest...to be wastefully, profligately cut down'. There was certainly a strong feeling that conservation limited waste, and perhaps an unspoken understanding that waste and 'wanton destruction' were sinful.

There was no suggestion that the forest should be conserved as an implicit statement of the colony's identity. There is none of the nationalism which becomes a clear argument for conservation at the turn of the century.

In 1874, there were in fact only two kinds of argument in support of conservation which carried obvious weight. One was a scientific argument, that the presence of forest had a beneficial effect on the climate. Vogel spoke of both the 'importance of preserving forests, and the injurious effects of destroying them'. They affected the climate by encouraging rain, and they prevented both floods and droughts by holding water and soil. The argument that forest provided shelter received less attention. The ecological argument for conservation—that forest destruction affected not just the physical but also the natural world—is a different scientific approach which found full expression only later, and was not present in 1874.

The most persuasive arguments at this time were economic ones. Some claimed that conservation supported development, others, without any idealistic implications, simply that conservation made money. Edward Stafford singled out the demand for railway sleepers; Charles O'Neill, representing the Thames Goldfields, stressed the timber requirements of the mining industry.

Reasons were also given for forest conservation specifically by the state. One philosophic argument ran that it was the nature of individuals to destroy and the duty of the state to protect. Cracroft Wilson felt that 'in the matter of forests, the Anglo-Saxon is the last man in the world that ought to be let alone'. The main reasons, however, were again strictly practical ones. Only the state had sufficient resources to achieve the necessary level of forest management, and only central government had sufficient resolve.

# Arguments against conservation

All other arguments opposed conservation. Some of them inclined people against state conservation, and against conservation by central government in particular. Some said the government should not be involved in conservation for economic reasons, since it would not make money. But the arguments were in most cases political or philosophic: conservation should be left to individuals or to provincial authorities, and national government should not interfere.

The provinces were engaged in a fierce power struggle with Vogel, who was intent on extending central government's influence. The disposal of public lands still lay with the Waste Lands Boards and was perhaps the most powerful exercise of power available at the provincial level. Any proposal to transfer the control of public lands was bound to meet intense opposition. William Fitzherbert even maintained that Vogel's Bill had 'nothing to do with forestry except as a shadow', since 'the real intent...is to take land'.

This much was politics, but sincerely held philosophic beliefs lay behind such a stance. State conservation was an unwelcome extension of central activity for those who still believed that government should be kept at a minimum. Stressing individual action, private enterprise and laissez faire, it seemed abundantly clear that those acting on their own initiative, rather than the state, would make the best conservators. It was 'to their own interest' for private individuals to look after their own property.

Some argued that Nature would conserve the forest so there was no need to involve the state. One parliamentarian said that 'natural agencies will largely, through all time, preserve a large proportion of the existing forests'; another, that 'there is a natural process of preservation that cannot be interfered with'. At a basic level, many argued that the extent of destruction had been overestimated. This implied a belief that forest was inexhaustible. Indeed, since 'there are many parts of this country encumbered to a great extent with timber', conservation was 'entirely unnecessary'. Financially, land could be put to better use than supporting tree growth, since agricultural produce was more valuable to the economy than timber.

'Half a million acres [202,300 ha] of bush land is calculated to produce sawn timber to the value of £22,000,000...Suppose this was cleared and cultivated, say in wheat...it would give a return of £4,000,000 per annum, which is a great deal better than the larger sum every thousand years.'<sup>24</sup> What value conservation, when clear-felling followed by agriculture promised nearly two hundred times the profit?

John Sheehan thought that 'any attempt to interfere with the destruction of native forests, would have an immediate effect in restricting the timber trade of the colony' and 'would drive a great many small and industrious settlers out'.

There were also scientific arguments against conservation. Perhaps 'the destruction of forest might be positively beneficial, and tend to bring about a much better state of things, as to climate, than existed before'—particularly on the West Coast, which was considered to have too much rain. Some held that native forests were bound to die out, so conservation was precluded by 'the nature of the trees themselves'. Sheehan gave a clear statement of displacement theory. He felt that 'the same mysterious law which appears to operate when the white and brown races come into contact—and by which the brown race, sooner or later, passes from the face of the earth—applies to native timber'.

Near the end of the spectrum come the philosophic or moral arguments against conservation. Not only did it interfere with private enterprise, but it was intrinsically opposed to settlement, and so should be resisted at all costs. Whenever a

country becomes populated,' said one, 'the timber has to give place to the utilization of the soil for the support of the people and the rendering of the country fit for settlement'. Another parliamentarian did 'not think any settler would...[clear] simply for the sake of destroying the forest; but he is compelled to do so that he may settle'.

Table 1: Parliamentarians for and against forest conservation, 1874

		Reasons given for conservation				Reasons given against conservation					
	Aesthetic	Moral	Scientific	Economic	Philosophic	Practical	Economic	Political	Basic	Scientific	Philosophic
Potts											
Pollen											
Vogel											
O'Neill											
Wilson	+										
Stafford											
T.B. Gillies									_		
Murray											
Fitzherbert											
J.L. Gillies				-							
Gibbs											
Sheehan											
Tribe											
Buckland											
T. Kelly					, , , , , , , , , , , , , , , , , , ,						

We might posit a further argument: native forest represented disorder, the opposite of civilisation, so there was a moral obligation to remove it. More simply, it may have seemed untidy, and in the Victorian moral code tidiness was a virtue just as waste was a sin. Conservation was a tidying up of native forest so that utilisation could follow, but even a fenced native forest would never display the symmetrical lines of a pine plantation. Any such thoughts, possibly held at an unconscious level, were not made explicit by the 1874 debate.

While it is commonly believed that nineteenth century settlers destroyed the forest because they hated it, documentary evidence for this is not forthcoming.

There is none in the parliamentary record. No parliamentarian presented the converse of the aesthetic argument, by remarking that forest was ugly or oppressive. Newspaper evidence suggests that many settlers found native forest less pleasing than exotic forest or open country, and some observers undoubtedly considered native forest 'gloomy'. This suggests displeasure, but hatred is not a safe inference.

I have attempted to differentiate the various attitudes to forest conservation displayed in Parliament in 1874. A further step—to tabulate these attitudes—is fraught with difficulty (Table 1). Most parliamentarians expressed an opinion, but some spoke too briefly to voice all their reasons for a particular attitude, or did not wish to reiterate reasons already expressed. However, by noting the arguments used by the fifteen politicians who spoke most comprehensively, a table of sorts can be made.

This approach can probably be taken no further. We simply do not know enough of particular individuals to place more than one or two of them firmly on our spectrum. What is very clear, however, is that the attitudes of early colonists to native forest varied a great deal. Contrary to popular belief, every European settler at the time did not just want to dispose of as much of the native forest as possible.

## Julius Vogel on forests, 1874

Vogel's position was clearly to one side of the spectrum. He spoke of a personal awakening to conservation when he visited the South Island and saw 'how very large was the demand for timber' for the railways and telegraphs he had so steadfastly promoted and 'how very great were the injuries caused by floods', and learnt 'how much deterioration our climate was liable to sustain, from the destruction of forests'. However, his presentation of the case for forest conservation was unashamedly derivative. His life was quintessentially urban and so he had no real knowledge either of native forest or of silviculture. His speech was a string of quotes from the writings of others.

The information which Vogel tabled in Parliament reflects a number of international influences upon him. Michael Roche suggests that Sir James Fergusson, the new Governor, alerted Vogel to the imperial debate on forestry at this time. Fergusson would have become well aware of this, not just through his earlier service in India, but also through his governorship of South Australia, immediately prior to his arrival in New Zealand in 1873. On the first day of 1874, the Otago Daily Times drew attention to the report by G.W. Goyder, Surveyor-General of South Australia, which recommended state forest reserves and public plantations should be organised by a forest conservator. Vogel began to outline his ideas on forest conservation in Dunedin four days later.

## T.H. Potts on forests, to 1874

Vogel acknowledged the influence of New Zealanders who had supported conservation earlier than he did, and in particular of T.H. Potts. Potts left Parliament in 1870, but he continued to write on conservation matters, so we can assess his thought in 1874 and position him on the spectrum. He wrote of the need 'to act as

faithful stewards, looking to the future well-being of the community' and 'did not think that in that matter of timber the authorities had acted the part'. The New Zealand environment was, for him, 'our page in the great Book of Nature', 26 towards which we had an obligation beyond the strictly utilitarian, though even for Potts one's first duty was to the human community rather than to the forest itself.

His ideas were his own, and what he read just sharpened conclusions he had already reached from his own observations of native forest. From his home near Christchurch, 'he had often seen Banks' Peninsula covered, for weeks together, with thick and lurid smoke'. He knew the bush intimately, and was appalled by its destruction through the 'indiscriminate issue of timber-cutting licenses' and by fire.

This shows the presence of a locally-inspired, radical voice in support of conservation, which lay further on that side of the spectrum than any heard in Parliament in 1874. It demonstrates the width of viewpoints available within the colony at that time, and the range of home-grown ideas which would later influence others. A parallel Australian example may be afforded by the opinions of the Victorian botanist, Ferdinand Mueller.<sup>28</sup>

It is important to mention these views, but we should look at all the colours in the spectrum, not just the indigo and violet. We should also remain healthily sceptical of all such 'colour-coding' of attitudes.

# New Zealand forest policy and conservation history

In *Green Imperialism*, Richard Grove states that, among environmental historians, 'conservation has been seen as deriving from a specifically North American setting'. He argues instead that 'the seeds of modern conservationism developed as an integral part of the European encounter with the tropics'.<sup>29</sup>

We may accept, with Grove, that 'emergent state environmentalism became more global in scope...through the wide development of professional science in the colonial context and through the further diffusion of climatic and medical environmentalism among intellectuals and in government'. To Grove's account of all this is fascinating, but he gives little consideration to the application (if any) of the ideas he traces. In the New Zealand context, growing awareness of the economic potential of local resources and an emotional identification by settlers with the local environment are factors of greater significance. The latter, in particular, does not feature in Grove's case studies.

Even with forest conservation alone, the New Zealand case does not conform with the pattern Grove leads us to expect from his Indian evidence. Grove downplays the American influence in relation to India and, by inference, to other British colonies. He states that 'the publication of *Man and Nature*...served only to aid the development of an already existing belief in a desiccation crisis of global dimensions'. This may be correct, but in New Zealand Marsh's book, rather than Indian data, was most often cited. It was claimed in Dunedin in 1874 that 'no attention was paid to the subject of Forest Conservation in any part of the

British colonies until after the publication of Mr Marsh's essay'. This does not bear close scrutiny - but it reaffirms the importance of Marsh.

Nor did the Scottish Hippocratic tradition, emphasised by Grove, have much affect on New Zealand forest conservation. The chief surveyor, James Hector, was a Scottish medic who came out of the same stable as Hugh Cleghorn and others identified by Grove as key players in Indian conservation, but there is no evidence of his background impacting on the New Zealand debate. Lauder Lindsay, an Edinburgh physician with experience of German forestry, argued for New Zealand forest conservation in 1867, but he did so from Britain and to no effect.<sup>34</sup>

Grove's colonial examples are all of societies like India where European powers governed more than settled. In these contexts, perhaps, it is appropriate to view the rise of conservation as a state activity promoted by a scientific lobby group. But in New Zealand, when central government first legislated for forest conservation, scientific argument was only a supportive factor behind actions motivated by the economics of settlement. Only with the promotion of island reserves in the 1890s can we clearly identify a scientific lobby influencing the government towards environmental protection.

The contemporary colonial example New Zealanders referred to most was Australia, not India. In 1876, when Vogel employed Campbell Walker, Conservator of Forests in Madras, the Indian example of course gained in relevance, but until then Cracroft Wilson was the only significant participant in the New Zealand debate who was strongly influenced by India. In 1874, while the international debate on conservation strongly affected Vogel's approach, parallel endeavours at the provincial level show a more genuinely New Zealand response to the local situation.

Joe Powell's examination of forest conservation in Australia around 1870 has yielded similar conclusions. He early identified the influence exercised on Australian reform by both American ideas and Indian models, but more recently has urged that 'greater consideration be given to emphatically local resolutions, as well as to the relevance of autonomous...communications within the so-called periphery'. 35

We need to be careful when working out what we then find about the mental landscape in these colonies at the time. Early usage of the word 'conservation' encourages us to delve here for enlightened attitudes to the bush, out of which modern 'conservationism' would duly emerge.

Graeme Wynn, in 1979, sought to identify a dissenting conservationist voice in New Zealand in the 1860s and 1870s, listing a series of events from a speech in parliament by T.H. Potts in 1868 through to Vogel's Forests Bill. This has become the orthodox lineage of conservation history in New Zealand. His picture is one of 'a handful of prescient individuals' battling, at first hopelessly, against a society which placed little value on the indigenous environment and engaged in 'the rapacious onslaught of the colony's forests'. 36

My evidence suggests that the 1874 bill is more constructively viewed not as a landmark in the history of environmentalism but, rather, as a new approach to

economic growth. Men like Vogel had little interest in saving the native flora and fauna. Except for Potts (and for him only sometimes), those concerned with forest conservation in 1874 did not want to protect it as an environment, but rather to control it as a resource.

#### Conclusion

The picture is of tremendously various opinion on forest and conservation. Vogel was by no means unusual in his concern, but he broke new ground by presenting a comprehensive solution which had not been heard in New Zealand before. The closest parallels to his approach perhaps lay not in New Zealand at all, but in proposals from South Australia, a colony more used to centrist control.

Though an emasculated version of Vogel's Bill was passed, no enthusiasm was shown for it, nor for Campbell Walker's proposals for a state forests department made during his tenure as State Forester in 1877. New Zealand society in the 1870s swept past not only Potts' kind of approach, but Vogel's approach as well.

There was some interest in conservation in every province, with regional variations depending upon local conditions. The failure to acknowledge these differences was one of the strongest criticisms of Vogel's approach. But forest conservation only gained extensive support where the profitable extraction of timber from the forest seemed realistic, and where this did not clash with the greater goal of European settlement. Climatic and other scientific arguments for protection convinced some but not others. The idea that forest should be preserved for its own sake was absent, and in the hard-headed world of a settler society, the beauty of the forest was not cause enough for conservation.

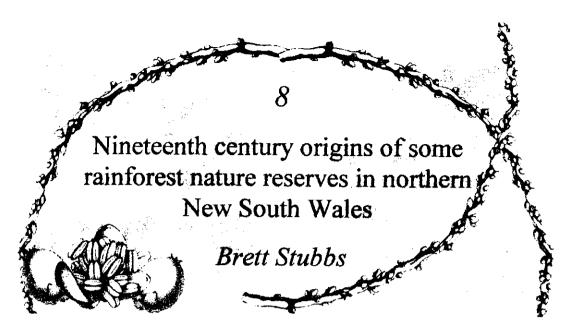
An analysis of the New Zealand situation yields three points of relevance to international debate. Firstly, this case study provides evidence of the kinds of influence stressed by Grove, but also confirms an American influence which he underrates. Secondly, it shows that local conditions and local responses have not been stressed enough. Lastly, it suggests that any links between early forest policy and the growth of environmentalism have been stressed too much. There has been disproportionate light thrown on the corners of what is, in fact, a much larger canvas.

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## Introduction

To the earliest European explorers, surveyors and settlers, one of the most distinctive features of the landscape of north-eastern New South Wales was the sub-tropical vegetation which occurred as riparian strips along the lower reaches of the coastal rivers, and more extensively in what is generally referred to now as the 'Big Scrub' area of the Richmond River district. This vegetation first attracted attention because of the stark contrast which its greenness and lushness provided to the dreary eucalypt-dominated open-forests which were typical of the belt of land situated between the great escarpment and the seaboard in eastern Australia. It also contained the valuable red cedar (*Toona ciliata*) which was heavily exploited from the late 1830s on the Clarence River, and from the early 1840s on the Richmond.

To the graziers, who were the earliest settlers in this region, and who primarily sought grassy open-forests to feed their stock, the brush was generally considered useless. Later, however, the brush vegetation, which occurred on the alluvial soils of the river levees and on volcanic-derived soils in areas of high rainfall, came to be associated with great fertility and productivity. This brushland was sought after by farmers when some of it began to be auctioned on the Clarence River in 1858, and later when the Crown lands of the colony were thrown open to free selection in 1862. The riparian brushes were cleared apace to grow maize, and later sugar cane, which could easily be conveyed to market or mill by river transport. In the Big Scrub, away from the rivers, the cost of transport retarded the development of agriculture, but from the late 1880s it too was rapidly cleared; sown with exotic pasture grasses, notably the South American Paspalum dilatatum, it became the mainstay of a burgeoning dairying industry. The clearance

history of the Big Scrub has not yet been documented in detail, but in general it can be said that it was largely selected but only slightly cleared in the mid-1880s, and had been almost entirely removed by about 1920.1

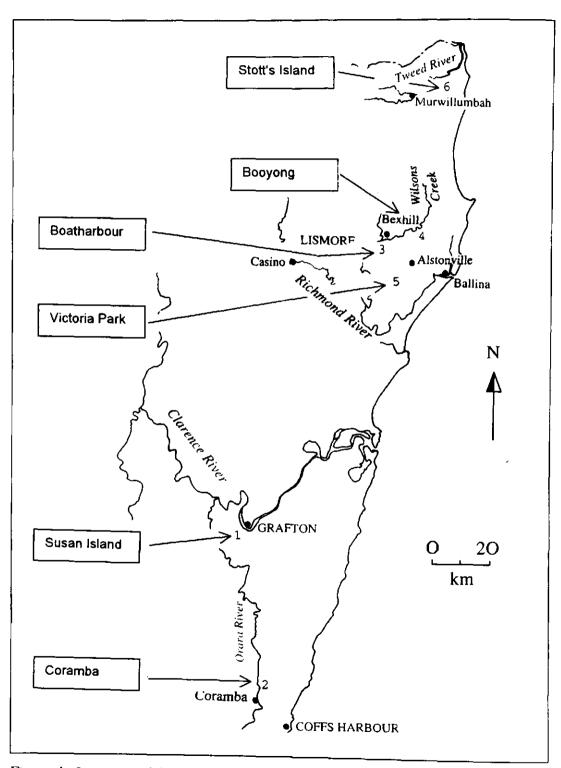


Figure 1: Location of the six rainforest reserves

Table 1: Six significant rainforest remnants in northern New South Wales

Name and location	Area (ha)	Map sheet	Reference
Susan Island N.R., Clarence River	23.0	Grafton	915162
Coramba N.R., Orara River	8.0	Moonee Beach	018590
Boatharbour N.R., Wilson's River	24.4	Lismore	322163
Booyong Reserve, Big Scrub	18.6	Dunoon	435201
Victoria Park N.R, Big Scrub	17.5	Wardell	399024
Stott's Island N.R., Tweed River	141.6	Murwillumbah	485725

Note: N.R. = Nature Reserves under National Parks and Wildlife Act of 1974. Grid references are to 1:25,000 topographic series. Area is of the whole reserve, not necessarily of the remnant rainforest.

Many small areas of rainforest survived the process of clearance in the nineteenth and early twentieth centuries, and today such remnants are prized by the regional community; they are protected, nurtured, and actively restored and regenerated. Indeed, 'rainforest regeneration' has become a significant activity, dare I say ritual, on the former brushlands of the northern rivers. Many remnants remain in private ownership, and are fostered through such organisations as the Big Scrub Rainforest Landcare Group. Most of the more significant remnants, however, are in public ownership. The purpose of this paper is to consider the reasons for the survival of some of the more important of these remnants; how did they survive when the vast majority of the brushlands were cleared? Six remnants have been chosen for examination (Table 1; Figure 1). All were found to have long histories of reservation from sale, ensuring that they remained immune from the general process of denudation. Additionally, the purposes for which they have been reserved in the past reveals something about changing attitudes towards the protection of native vegetation. Three of the remnants considered here were included in a study by Lunney and Moon of flying fox camps in north-eastern NSW.<sup>2</sup> Although this and the earlier paper have some sites in common, and both present land-use histories of the districts in which their sites occur, the present work differs in purpose from that of Lunney and Moon in that it is focussed on the historical question of reserve creation and rainforest preservation. Moreover, some sites differ, and use has been made here of a range of further sources.

Evidence of the rationale for various decisions about reserve creation in northern New South Wales could be expected to be contained in the records of the Miscellaneous Branch of the NSW Department of Lands. It seems after extensive searches of Government Archives, however, that many of these records no longer exist. This research has relied, therefore, largely on notices published in the Government Gazette, and on plans of reserves prepared by government surveyors. These sources, through their attention to dates, areas, and boundaries, have provided a sturdy skeleton to the story; the apparent loss of the relevant Miscellaneous Branch records, however, may have deprived it of some of its flesh

# Rainforest and the Clarence Forest Reserves

Towards the end of 1871, a series of reserves comprising about 190,000 hectares of forested land was created for the preservation of timber in the Clarence, Richmond and Tweed River Districts of New South Wales.<sup>3</sup> Known collectively as the Clarence Forest Reserves, they were among the first timber reserves in the colony, and they were reserved from sale and also exempted from the operation of timber licences, meaning that they were protected from both free selectors and timber cutters.

It seems probable that these reservations had their genesis in a campaign begun in the early 1860s by Enoch William Rudder (1801-1888), the founder of the town of Kempsey on the Macleay River. Rudder, who had experimented extensively with the preparation of dyes from insects, minerals, and plants found in the colony, became concerned at the rapid rate of clearance of vegetation from the alluvial flats bordering the Macleay River. He recommended to the Secretary for Lands, radical politician John Bowie Wilson (1820-1883), the reservation of 'certain areas of land in a state of nature, such as [the] magnificent brushes', for the 'preservation and culture of indigenous productions', notably dye-producing plants.<sup>4</sup> The Minister took up his suggestion 'warmly', and even directed reservations to be made, but the matter lapsed with a change of government. Rudder revived it in April 1865 with a letter to the Acclimatisation Society urging that organisation to use its influence to secure the reservations he sought, for if steps were not taken immediately, he believed, 'none of any real value will be to be had'.<sup>5</sup>

Rudder's concerns were amplified the following month by a writer to the Sydney Morning Herald who said that what Rudder described as taking place on the Macleay River was also 'going on along the Manning and Clarence—in fact, on all those rich alluvial flats which border our great rivers, and were but yesterday densely clothed with semi-tropical forest'. He complained of a 'rush to obtain these most fertile lands, at a tithe of their value, for the growth of maize'. This, the anonymous writer warned, threatened 'wholesale destruction not only to the most interesting part of our Flora and Fauna, but to much that is of sterling value, especially in the vegetable world'. Many trees, he said, were being 'summarily burnt off the ground, which we can ill spare for purposes of use or ornament'. He hoped that 'some portions of the yet uncleared river-side brushes in the North [could be] reserved, both for scientific purposes and in order to prevent the extinction of valuable species of animals, plants, and trees'. This 'must be done soon, or, in a few years, scarce a vestige will remain of those stately evergreen forests which but lately were the glory of Australian scenery'.

By 1870, still no action had been taken in reserving areas of brush vegetation, so Rudder reiterated his concerns in a petition to the Legislative Council. He sought an act of parliament to provide for the preservation of the 'indigenous productions of [the] soil... for the purposes of science, the arts, manufactures, or ornament. Such natural products might now be abundant, he said, but 'must eventually disappear from all parts of the Colony as the process of clearing is

carried on'. Plants existed with properties which made them valuable not only for dye making—Rudder's primary interest—but for medicinal use, fibre production, fodder for cattle, and food for man. But 'before the axe, hoe, and fire,' all these 'varied and valuable productions' were rapidly diminishing, and in some places many were probably already extinct.

Rudder advocated a system of reserves, varying from 10 to 20 acres [4-8 ha] each in area, with two or more within every district. Within each reserve the destruction of, or wilful injury to, their 'indigenous products' should be made a crime punishable by law. If in time a population should become settled around or near such reserves, they might be 'appropriated as pleasure grounds for the benefit of the public' and be vested in the hands of local trustees. Rudder anticipated objections to his reserve system on the grounds that the areas might harbour agricultural pests, and suggested that such animals might easily be destroyed and that fallen timber and hollow logs which might afford them protection could be removed from the reserves. Moreover, he believed that this problem would be of 'comparatively short continuance', while 'the advantages to be gained, by the dedication and preservation of such blocks of land for the purposes indicated, would extend over an unknown but extensive period of time, and be appreciated by generations yet unborn'.

The following year, in September 1871, the first Clarence River timber reserves were gazetted, an apparently direct if delayed response to the campaign begun by Rudder in the early 1860s. It fell to John Bowie Wilson, who at the end of 1870 succeeded John Robertson, the architect of free selection, in the position of Secretary for Lands, to carry out what he had undertaken to do in 1864 when he first occupied that office. No act of parliament, however, nor systematic, colony-wide approach to reservation was forthcoming. Rather, the Government relied on existing provisions within the lands legislation to make the *ad hoc* series of reservations. Specifically, the 4th and 5th sections of Robertson's *Crown Lands Alienation Act* of 1861 provided for the setting apart and reservation from sale of Crown lands for various 'public purposes'.

Soon after the passage of the Crown Lands Alienation Act, a considerable number of reserves were created across the colony 'for the preservation of water supply or other public purpose'. Among these was the general reservation, for unspecified purposes, of 'all islands within the Colony of New South Wales', with some exceptions which included Palmer's, Michelo, and Woodford Islands in the Clarence River.<sup>8</sup> It was not until 1871, however, that the first reservations from sale were made for the specific purpose of 'preservation of timber'.

At the beginning of December 1871, William Carron (1821-1876), botanical collector, was detached from the Botanic Gardens in Sydney to accompany the Government Surveyors in the 'Northern Districts' for the purpose of reporting on the portions of land selected as timber reserves. The rationale behind the creation of the first Clarence Forest Reserves is apparent in Carron's reports and in accompanying correspondence. Carron wrote that 'many valuable timber trees,' including *Dysoxylum fraserianum* (rose-wood), *Harpullia pendula* (tulip-wood) and *Castanospermum australe* (black bean):

which a short time ago were so plentiful in and around Grafton are now almost entirely cleared away; indeed, there are several species of which not a tree is left in this neighbourhood, and some others...have only here and there a solitary representative left. So completely have they disappeared in the course of a few years that cargoes of timber are now being brought from the Richmond River to supply the local saw-mills, which are working where the finest timber trees that could be desired...were a short time ago so abundant, but which have been all burned off or destroyed in other ways.

Indeed, timber exports from the Clarence in 1870 totalled only 17,000 feet (plus sundry spokes and staves) but 400,000 feet [944 m³] of sawn timber was imported from the Richmond River that year. The Director of the Botanic Gardens, Charles Moore, in transmitting Carron's report to the Secretary for Lands in April 1872, commented:

Should the Government finally approve of these reserves, it will be the means of preserving from total destruction many of the finest and most beautiful of our native trees...I would venture to suggest that similar reserves to these should be made, as far as practicable, on the Bellinger, the Nambucca, the Macleay, the Hastings, and the Manning, otherwise the natural forest vegetation will soon entirely disappear.<sup>11</sup>

Carron's comments in particular are a strong indictment of the uncontrolled agricultural clearance which had taken place along the northern coastal rivers, and bear out Rudder's fears of seven years previously. In respect of the river-side brushes, Rudder's principal concern, the official response had come too late. In August 1871, several months before Carron was despatched to the Clarence, a visitor to the river described the destruction of vegetation that he observed. 'The land all along the river banks is taken up', he wrote, 'and is under cultivation for an average depth of about a quarter of a mile', the approximate width of the fringing brush.<sup>12</sup> This remark applied to the islands as well as the mainland:

The Clarence River is prolific in islands...and nearly all of them are populated by settlers who have acquired small farms by conditional purchase. The thick brushes which once grew here have been cut down on most of the islands, and given place to cultivation.<sup>13</sup>

Thus, by the time Carron began his task of reserve selection in December 1871, little remained of the river-side brush that he might have some areas of it set aside.

In selecting the areas of land in the Clarence, Richmond and Tweed River districts for reservation in 1871 and 1872, Carron, and District Surveyor Donaldson, chose sites which afforded 'the greatest number and variety of trees', but—and this is an important condition—which did not 'check the operation of free selection'. In meeting the second requirement, reserves were made, where practicable, on land unsuitable for agriculture, such as 'barren stony ridges and moist flats,' or in localities where there was an abundance of unalienated land of the same or better quality. Thus, even at the advanced stage of clearance which had been reached by the early 1870s, the preservation of representative areas of brush was apparently compromised by the need to give priority to agriculture.

As well as selecting areas containing valuable brush timbers, Carron also selected reserves containing useful hardwood. In fact, the greater proportion of the area gazetted as reserves in 1871 and 1872 contained hardwood forest, not brush. The only area of brush near Grafton which Carron was able to recommend for reservation was a small area six or seven miles from North Grafton which, 'although the greater part of the larger timber trees has been cut out, there are a great many trees of various kinds which in the course of a few years will be valuable if allowed to stand'. 16

#### Susan Island Nature Reserve

It seems that the general reservation from selection made in 1862 of islands in New South Wales rivers was still in place in respect of some of the Clarence River islands when Carron made his visit in 1871. In addition, Susan Island, a sixty hectare brush-covered island situated in the river adjacent to the city of Grafton, had been dedicated as a reserve for public recreation in the previous year. Thus, an observer was able to remark in 1871 that 'the tourist may form some idea of the Clarence as it was when first discovered... from the vegetation which still grows in rank luxuriance on some of the smaller islands—emerald gems in the glittering stream'. Carron, however, noted that:

The vegetation on the small islands which have been reserved on the Clarence River is likely to be destroyed, unless they are looked after, especially those below Grafton...The brush has already been partially destroyed on one of them, and steps should be taken to check this, or a great deal of damage may soon be done on these useful ornaments to the river. 19

The reservation of Susan Island in 1870 had been achieved through the lobbying of a number of Grafton residents, notable among whom was James Fowler Wilcox (1823-1881), a naturalist who had served in that capacity alongside John MacGillivray and Thomas Huxley on the voyages of exploration of HMS Rattlesnake in the late 1840s, and who had settled at South Grafton in 1857. It is not known how or even whether this reservation was connected to Rudder's proposed scheme of protected areas. It was nevertheless an important achievement in that Susan Island now contains one of very few remaining areas of riparian rainforest in New South Wales, and the only significant area in the lower Clarence River.

It cannot be ascertained exactly what role Wilcox played in the reservation of Susan Island, but it is known that by 1865 he had already established, on his own property on the south bank of the Clarence River opposite Susan Island, a reserve where could be seen 'many beautiful varieties of brush timber' and where 'many of our most interesting birds' had found refuge. Wilcox was one of the first five trustees of the Susan Island reserve appointed on 25 March 1870, and he wrote to the Clarence and Richmond Examiner the following month to express his great pleasure at the reservation and to invite 'every citizen' to assist in protecting the animals, birds and plants of the island. There was 'no island in the

colony so rich in botany and zoology', so he hoped they would unite in supporting a prohibition of 'the cutting of timber, shrubs, grasses, or any plants...as there are many choice plants which are not to be found near Grafton'. 'Shooting should not be allowed, for in protecting the vegetation for the inhabitants, you are also giving a home to some of our rarest birds, which are fast disappearing from the district, having been driven from their old haunts by the woodman's axe'. Thomas Bawden, fellow inaugural Susan Island trustee and MLA for the Clarence electorate, later said of Wilcox that he was one who 'did so much to bring under public notice the natural history of our district'. 23

A visitor to Grafton in 1871 remarked that 'one of the best things in the way of reserves is a lovely little island lying in mid-channel between North and South Grafton'. Susan Island would become, he was sure, 'the favourite place of popular resort' as soon as 'a landing place has been formed and a few walks made through the tangled undergrowth of vines'. Another visitor the same year was escorted to the island by Wilcox who described it as 'a reserve for public shade and recreation, where the inhabitants of Grafton are to come and study the harmony of nature, each under a vine, a fig, or a bean tree.

On 16 January 1907 the reservation of 1870 was revoked, and Susan Island was included with nearby Elizabeth Island in a new reserve dedicated for public recreation. It is evident that Wilcox's goal of maintaining Susan Island in a state of nature for the pleasure of the public was not maintained by subsequent reserve trust members for as early as 1926 most of the original brush had been cleared, or burnt preparatory to clearing. A survey plan of the island made that year shows such recreational features as fireplaces, jetties, seats and tables, a pavilion, and even a rifle range replacing the native vegetation on the southern end of the island. In 1943 a 20 acre [8 ha] portion of the island on its south-western side was revoked and reserved for a proposed national fitness camp, but this appears not to have proceeded for in 1957 the whole of the two islands were re-dedicated for public recreation.

In 1982 an area of 23 hectares on the northern end of the island was declared a Nature Reserve under the *National Parks and Wildlife Act* of 1974, and placed under the jurisdiction of the National Parks and Wildlife Service.<sup>29</sup> The rest of the island, together with Elizabeth Island, remained as a Crown reserve under the control of a reserve trust. By this time only the northern tip of the island, that part claimed by the National Parks and Wildlife Service, retained its primeval cover of rainforest.

# Coramba Nature Reserve

The dense riparian rainforests, although continuous along the lower reaches of the Clarence River, diminished to isolated pockets towards the upper reaches. Susan Island marked the approximate upper limit of the continuous brush. Along the Orara River, which flows into the Clarence from the south about 30 kilometres upstream of Grafton, the brush occurred in a similar disjunct distribution.

In October 1879 a settler named William Carroll selected 40 acres of land on the western side of the Orara River about 3 kilometres downstream of the present village of Coramba, and about 150 kilometres upstream of Grafton. Carroll's move apparently spurred the government's reserve-makers into action for in 1880 a 50 square mile [12,950 ha] tract of country adjoining his selection to the south was set aside for the preservation of timber, part of the continual augmentation of the timber reserve system begun for the Clarence district in 1871. Simultaneously, 140 acres [57 ha] of land to the immediate north of Carroll's selection was reserved for 'camping and public purposes'. The next year, 1200 acres [486 ha] of land immediately to the north of this reserve was set aside as a possible village site. The Government had thereby very effectively prevented the further alienation of land in the vicinity of Carroll's selection.

Reserve 645 for 'camping and public purposes' contained at its eastern or Orara River end the patch of rich brushland which now constitutes the Coramba Nature Reserve. The western portion of the reserve consisted of high, stony ridges covered mainly with dry, open-forest. In between was a grassy black-soil plain, part of which (4.6 ha) was reserved in 1898 for 'public recreation' and on which a sporting field was created,<sup>33</sup> and the remainder of which was leased in 1900 for dairy farming.

Also in 1900, in the western, open-forest part of reserve 645, the reserved area was drastically reduced to only 32 acres [13 ha] and redesignated as a 'reserve for the preservation of native flora'. The eastern, 12 acre [5 ha], brush section was redesignated for the same purpose. In 1969 it was combined with some of the adjacent 'open grassed plain' in a new reserve for 'public recreation and the preservation of native flora'. In 1982 the riparian brush section of this reserve became a Nature Reserve under the *National Parks and Wildlife Act* of 1974.

Despite careful searching of the Lands Department's Miscellaneous Branch records, no details have come to light concerning the reasons for the 1900 preservation of native flora' reserves. It can be said, however, that many such reservations were made around this time and that the Coramba case is certainly not atypical within the region. It must be concluded that the patch of riparian rainforest within the present Coramba Nature Reserve owes its survival largely to the reservation of the site at an early date in relation to the beginning of free selection in the area.

# **Boatharbour Nature Reserve**

Long before William Carron set about his task of reporting on the Clarence Forest Reserves, and even several years before the beginning of free selection, surveyors were at work laying out a series of reserves for various 'public purposes' in the District of Clarence. In the Richmond River area a series of 22 such reserves encompassing about 120 square miles [31,080 ha] of land was created in 1858. These reserves included a considerable proportion of the river bank lands of the navigable parts of the Richmond River and its two main branches.<sup>37</sup> Several encompassed towns such as Casino and Lismore which had

been laid out earlier in the 1850s.<sup>38</sup> The immediate effect of this reservation was to exclude these lands from the pastoral runs of which they were part, and to prevent the purchase of the lands by the squatters under their pre-emptive rights. This move was particularly prompted by applications from Clark Irving to purchase a large area of river bank land within his Casino run which would have given him 'undue command over water required for the beneficial occupation and cultivation of the adjoining country'.<sup>39</sup>

Reserve No. 5 in the Richmond River series was a 2.25 square mile [583 ha] area of land at the confluence of Wilson's and Cooper's Creeks—the head of navigation for boats—about 10 kilometres upstream of the town of Lismore. Immediately prior to the beginning of free selection this reserve, among many others, was redesignated as a 'reserve from sale' for 'the preservation of water supply and other public purposes' to protect it from the influx of free selectors which was to begin early the following year. In 1864 part of this reserve was redesignated as a site for the Village of Bexhill.

In 1885, the 2.25 square mile reserve was revoked and in its place, and within its original boundaries, several smaller reserves, for a multitude of purposes, were created. Among them was the 140 acre [57 ha] Reserve 30 for 'camping', presumably for the use of teams drawing timber for shipping from the Boatharbour wharf. This reserve, situated on the southern side of Wilson's Creek and bisected by the road from Lismore to Bexhill, included the main section of the present Boatharbour Nature Reserve.

For reasons that cannot be ascertained, in 1903 the entire camping Reserve No. 30 (the Boatharbour Reserve) was revoked and in its place two reserves were created: a western section of 48 acres [19 ha] containing mostly brush 'for public recreation and preservation of native flora' (the present Boatharbour Nature Reserve) and an eastern section of 36 acres [15 ha] containing a natural open grassland, for 'water supply and camping'. The two were separated by the Lismore-Bexhill road. A substantial proportion (about 40 acres [16 ha]) of Reserve 30 ceased to be reserved at this time.

Apart from a tiny addition of land in 1966, the Boatharbour Floral Reserve remained unchanged until 1987 when it was dedicated as the Boatharbour Nature Reserve under the *National Parks and Wildlife Act* of 1974. Included with it in the Nature Reserve, however, was a small reserve (about 8 acres [3 ha]) on the opposite side of Wilson's Creek. This was another part of the original 1858 reserve which had been set aside for 'wharfage, camping and crossing' in 1894 and for 'public recreation' in 1922. The Nature Reserve has since been augmented by the addition of another small area (8 acres [3 ha]) on the northern side of Wilson's Creek, another part of the 1858 reserve which had been set aside in 1894 for 'access'. Like Coramba Nature Reserve, the riparian rainforest at Boatharbour Nature Reserve owes its survival to its protection from free selection. In contrast, however, in this part of the Richmond River free selection began almost immediately after the coming into effect of the *Crown Lands Alienation Act* at the beginning of 1862, so a much earlier reservation was required than at Coramba to achieve the same effect.

### Marshall's Falls and a District Rainforest Park

Early in 1899, the Rev. William Walter Watts (1856-1920), the Presbyterian Minister at Ballina, made a public plea for the establishment of a 'Richmond River Park', one large reserve embodying the various typical elements of the rapidly disappearing Big Scrub. He was concerned that 'unless something is done, and done soon, there will scarcely be a patch of this beautiful scrub left for the delectation of coming generations'. Watts combined with his pastoral duties a keen interest in botany, chiefly in ferns and mosses, and contributed papers on the subject to the Proceedings of the Linnean and Royal Societies of NSW. From 1909 until 1916 he was Honorary Custodian of Ferns and Mosses in the National Herbarium of NSW where he added considerably to the national collection of these plants.<sup>48</sup>

The site which Watts had in mind for a park was the valley of Duck Creek, below Marshall's Falls at Alstonville, between Ballina and Lismore, a piece of scrub 'richly endowed with the characteristic trees, ferns, orchids, mosses etc. of the Big Scrub'. Watts drew up a memorial for presentation to the Minister for Lands seeking the resumption of 'as much of this country as might be thought necessary' and its reservation 'to all time for the use of the people'.<sup>49</sup>

This was not the first time that an attempt had been made to create a reserve around Marshall's Falls. Ten acres had been surveyed around the falls in 1892 for the purpose of creating a public park, with access roads from the north and south, the land proposed to be acquired under the Lands for Public Purposes Acquisition Act. 50 This proposal, a much less ambitious one than Watts's, was settled when the Minister instructed that the matter should be put aside 'until falls were scarcer or money was more plentiful'. 51 Despite the Minister for Mines and Agriculture, Joseph Cook, visiting the falls in May 1899 and promising to 'do anything in his power to reserve the place for the recreation of the people of the district for all time', the district park proposal evidently foundered. In the middle of 1901, the Northern Star wondered what had become of the agitation for the Marshall's Falls reserve, and, noting that the scrub was to be felled 'in the coming spring', feared that the 'picturesque spot' would be 'lost forever'. 'Seeing that the district possesses so few of these places now threatened with extinction, it is to be regretted that the district members have not given more consideration to a question so practical and important as the preservation of these beauty spots' 52

# **Booyong Reserve**

Watts's proposal to create a public park around Marshall's Falls may have been unsuccessful, but the local interest which he generated in campaigning for it had wider effects. The committee which was formed in Ballina to agitate for the resumption of land around Marshall's Falls pursued a number of other similar proposals in other localities, and probably stimulated other groups and individuals to do likewise. The Ballina Committee's other proposals included the reservation of 100 or 150 acres [40 or 60 ha] of land at Booyong, a locality convenient to

Lismore, and to Ballina also when a proposed branch railway was built. Independently, the Pearce's Creek Progress Association also took steps to urge the reservation of 100 acres [40 ha] of land at Booyong.<sup>53</sup>

Early in 1900 a small area (about 3 acres [1.2 ha]) of land on Cudgerie Creek at Booyong, adjacent to the Lismore-Tweed railway line, was reserved for 'preservation of native flora'. This land was within the Booyong Village reserve which had been created in 1892 from an earlier reserve 'for future public requirements'. Presumably as a result of local campaigning, this small flora reserve was revoked later in 1900 and was included with some adjacent land in a much larger reserve for the same purpose. This reserve was redesignated 'for public recreation and preservation of native flora' in 1930 to become the present Booyong Recreation Reserve. Unlike the other rainforest remnants discussed here, Booyong Recreation Reserve has not passed into National Parks and Wildlife Service control, but remains a Crown reserve under the management of a local trust. Reflecting its double purpose of flora preservation and public recreation, about one-third of the reserve today is cleared land containing sporting fields and other public facilities.

#### Victoria Park Nature Reserve

A 200 acre portion of 'dense brush' near the southern edge of the Big Scrub plateau was reserved in December 1879 for 'water supply and other public purposes'. The vegetation on Water Reserve 545, as it became known, was given further protection in 1887 when the reserve was exempted from the operation of timber cutter's licences. A small triangular part of this reserve (about 43 acres [17 ha]) was dedicated for public recreation in December 1898. This is the land presently known as Victoria Park Nature Reserve.

Later in 1898 the remainder of Water Reserve 545 was revoked and in its place was created a reserve for the preservation and growth of timber. In 1907 this timber reserve, which had an area of about 121 acres [50 ha], was redesignated for 'public recreation and preservation of native flora'. As was typical of large patches of virgin scrub set amidst cleared farm land, Reserve No. 41444 adjacent to Victoria Park harboured noxious weeds and vermin and became an annoyance to nearby land-holders. The Rous and Uralba Districts Progress Association asked for the boundary lines of the reserve to be cleared, and for a wire netting fence to be erected to keep vermin within the reserve. This was apparently a last resort, the Association having failed in its attempts to have the Minister revoke the reserve. The Meerschaum Vale Progress Association had similar concerns and sought to have the reserve 'made available for selection'. Perhaps as a compromise, the Department of Lands appointed a reserve trust whose three members included Robert Graham, the owner of much of the land surrounding the reserve.

Reserve 41444 survived until after the First World War when it succumbed to the demand for land to settle returned soldiers. It was subdivided in 1919 into two 60 acres [24 ha] Homestead Farms and had been about half cleared of its cover of

dense brush when these were surveyed in 1921.<sup>65</sup> Victoria Park was soon left as a small isolated remnant, surrounded by cleared farmland. Even the brush within the reserve was reduced in area thereafter; about half of its 43 acre [17 ha] area had been reduced to grassy paddocks by the time it was surveyed in 1941.<sup>66</sup> In 1975 the site became Victoria Park Nature Reserve, and since then it has undergone active regeneration to expand the remnant to fill the previously cleared parts of the reserve.<sup>67</sup>

#### **Stott's Island Nature Reserve**

Stott's Island is a 350 acre island in the lower reaches of the Tweed River. It was reserved in 1878 for the 'preservation and growth of timber'. At the end of the 1870s, the vast majority of the timber reserves in the Tweed-Richmond-Clarence region had been opened for timber removal under various forms of timber cutting licence; on only a very small area (about 0.5 per cent) was no timber cutting allowed. These exempted areas comprised twenty-three forested islands in the Tweed River (including Stott's Island), six in the Richmond River, and twenty-four in the Clarence which had been reserved principally to 'protect the land from being washed away, so that navigation may not be impeded by silting'. Additionally, those in the Richmond and Tweed Rivers were said to have 'natural foliage' which was 'of great beauty and very ornamental to the river'. There was thus an aesthetic purpose in these reservations, although this was, ostensibly at least, subsidiary to the more practical purpose of protecting the banks of the rivers for navigation.

In 1902 the Stott's Island reserve was redesignated for the preservation of native flora. The island became a reserve for 'public recreation and preservation of native flora' in 1914, and in 1960 it became a reserve for 'public recreation and the promotion of the study and the preservation of native flora and fauna'.

All the above forms of reservation lacked security by virtue of the ease with which they could be revoked. The Fauna Protection Act of 1948, however, created a new tenure under which areas of Crown land could be dedicated to fauna protection with a more secure, almost permanent status, requiring an act of parliament for their revocation. Stott's Island achieved such status on 2 June 1971 when it was dedicated 'for the purpose of the protection and care of fauna, the propagation of fauna and the promotion of the study of fauna' in terms of the Fauna Protection Act, under the name Stott's Island Nature Reserve.<sup>73</sup>

# Changing perceptions of rainforest

Concern over the loss of rainforest in north-eastern NSW is no new thing. It began in the earliest days of clearance for agricultural settlement when protection was sought for both future use and ornament; to avoid the waste of valuable resources as well as for the pleasure of the inhabitants. Only one of the six remnants examined here—Susan Island—comes close, however, to having been

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originally reserved expressly for such purposes. Most of the remnants were originally reserved from sale for purposes such as camping, water supply, village sites, and timber supply which, in a clearly practical sense, aided the process of settlement.

The desire to preserve pieces of the rainforest was clearly a reaction to its rapid destruction. This is evident in Rudder's campaign from the Macleay in the early 1860s, in Carron's attempts to select suitable areas for reservation on the Clarence in the early 1870s, and in Watts's pleas for the establishment of a Big Scrub rainforest park in the late 1890s. The extent to which their desires could be achieved was limited, however, by the various conflicting values and priorities which existed in the community at the time. Watts, like Rudder, was keenly aware that patches of uncleared scrub were perceived by the farming community more as havens for paddymelons, flying foxes and other 'vermin' than as gifts for the delectation of coming generations.

The reservation of Susan Island in 1870, although under the general heading of 'public recreation', was essentially for nature preservation, which is remarkable given the clear official attitude at that time of giving priority to agricultural needs. The majority of the original vegetation of the island was subsequently cleared, however, for uses which, although clearly contrary to Wilcox's original vision of nature preservation and nature-based recreation, were consistent with the general purpose of the reserve. Here and elsewhere reservation for 'recreation' provided inadequate protection for the rainforest when open space was sought for sporting fields and other public facilities.

The widespread reservation in New South Wales around the end of the nine-teenth century of patches of native vegetation specifically for 'the preservation of native flora' indicates the development within the community of a much more general desire to preserve some of the rapidly disappearing native vegetation than was present in the 1860s and 1870s. The creation of these flora preservation reserves was enabled by the existence of patches of relatively undisturbed native vegetation within the network of public reserves which had been created to facilitate settlement. As Watts discovered, although it had become acceptable to unashamedly set aside areas of bush expressly for 'flora preservation', the idea of resuming alienated land for such a purpose was another matter, highlighting the importance to our present network of rainforest reserves of the somewhat fortuitous survival of vegetation within reserves originally created for very different purposes.

#### Notes

GG = New South Wales Government Gazette. VPLA = Votes & Proceedings, New South Wales Legislative Assembly. JLC = Journal, New South Wales Legislative Council.

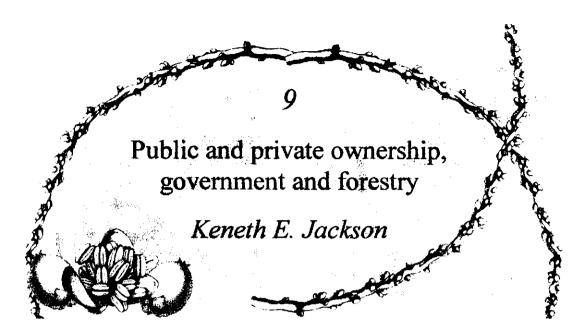
- 1 The clearance history of the Big Scrub is considered in detail in another paper presently in preparation.
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#### Stubbs-Rainforest reserves

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- 4 Rudder, E.W., Evidence (24 October 1862) to the Select Committee on the State of Manufactures and Agriculture in the Colony, New South Wales Legislative Assembly, Votes & Proceedings, 5: 28-34.
- 5 Sydney Morning Herald, 15 May 1865; reprinted in Clarence & Richmond Examiner, 23 May 1865.
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- 9 Report on Timber reserves in the Clarence River District. JLC, 1872, 1: 139-40.
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- 11 Report on Timber Reserves in Clarence, Richmond and Tweed River Districts. VPLA, 1872, 2: 861.
- 12 Sydney Mail, 2 September 1871: 860.
- 13 Sydney Mail, 26 August 1871: 827.
- 14 Report on Timber Reserves in Clarence, Richmond and Tweed River Districts. VPLA, 1872, 2: 861, 872.
- 15 Report on Timber Reserves in Clarence, Richmond and Tweed River Districts. VPLA, 1872, 2: 872.
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- 17 GG, 18 February 1870:399; see also Clarence & Richmond Examiner, 1 March 1870.
- 18 Sydney Mail, 2 September 1871: 860.
- 19 Report on Timber Reserves in Clarence, Richmond and Tweed River Districts. VPLA, 1872. 2: 872.
- 20 Sydney Morning Herald, 15 May 1865; reprinted in Clarence & Richmond Examiner, 23 May 1865.
- 21 GG, 25 March 1870; 697; Clarence & Richmond Examiner, 5 April 1870.
- 22 Clarence & Richmond Examiner, 19 April 1870.
- 23 Law, R. C. (ed.), 1989. The Bawden Lectures, 4th edition: 90. Grafton: Clarence River Historical Society.
- 24 'The Tourist. The Clarence in 1871', The Sydney Mail, 14 October 1871: 1046.
- 25 'Jottings by the Way', Town and Country Journal, 20 May 1871: 619.
- 26 GG, 16 January 1907: 293; 204 acres.
- 27 Plan no. Ms. 1873 Gfn, survey completed 17 May 1926.
- 28 Reserve No. 71029. GG, 5 November 1943: 1959; GG, 3 May 1957: 1406, 1410; 204 acres.
- 29 NR proclaimed 5 May 1982. 23 hectares. GG, 14 May 1982: 2090-1.
- 30 Reserve No. 642. GG, 23 August 1880: 4325.
- 31 Reserve No. 645. GG, 23 August 1880: 4324
- 32 Reserve No. 779. GG, 26 September 1881.
- 33 Reserve No. 28519. GG, 19 November 1898: 9077.
- 34 Reserves no. 31074 and 31075. GG, 23 June 1900: 4882.
- 35 Reserve No. 87204, 38 acres. GG, 6 June 1969: 2129.
- 36 NR proclaimed 4 August 1982. 8 hectares. GG, 13 August 1982: 3668.
- 37 The North Richmond River, now Wilson's River, and the South Richmond River, now Bungawalbin Creek.
- 38 'Richmond River Reserves', GG, 24 August 1858: 1364-5.

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- 39 See 'Return in reference to pre-emptive right exercised by Clark Irving. Esq.', Votes and Proceedings, NSW Legislative Assembly, 1861, 2: 939-70.
- 40 Reserve 11. GG, 24 December 1861: 2758.
- 41 GG, 10 March 1864: 632.
- 42 GG. 18 November 1885: 7431-2.
- 43 GG, 18 November 1885: 7439.
- 44 GG, 30 May 1903: 3991-2.
- 45 GG, 1 July 1966: 2667; GG, 13 November 1987: 6273.
- 46 Reserve No. 20647. GG, 26 May 1894: 3377; Reserve No. 55748. GG, 20 October 1922: 5713.
- 47 Reserve No. 20643. GG, 26 May 1894: 3376.
- 48 Nangle, J. 1921. Presidential Address, Journal and Proceedings of the Royal Society of NSW, 55: 3-4.
- 49 'A plea for a Richmond River park', Northern Star, 1 February 1899: 3.
- 50 Plan no. Ms 366 Grafton.
- 51 Northern Star, Editorial, 1 February 1899; 'Marshall's Falls', 22 April, 1899.
- 52 Northern Star, 20 July 1901.
- 53 'The reserve question', Northern Star, 10 February 1900.
- 54 Reserve No. 30746. GG. 24 March 1900: 2398.
- 55 GG, 17 December 1892: 9996; Reserve No. 676, GG, 25 October 1880: 5512.
- 56 Reserve No. 31508, 52 acres. GG, 22 September 1900: 7431, 7436.
- 57 Reserve No. 62153, 46 acres. GG, 3 October 1930: 3944.
- 58 Reserve No. 545. GG. 8 December 1879: 5416.
- 59 GG, 16 December 1887: 8327.
- 60 GG, 3 December 1898: 9441.
- 61 Reserve No. 28778. GG. 30 December 1898, pp. 10136, 10147.
- 62 Reserve No. 41444/5. GG, 20 March 1907: 1854.
- 63 Northern Star, 6 April 1907: 10.
- 64 GG, 15 May 1907: 2741.
- 65 Plans nos. R8286.1759 and R8287.1759.
- 66 Plan no. Ms 3231 Grafton.
- 67 Proclaimed 11 April 1975, 17.5 hectares. See Nagle, J. 1988. Assessment of a rainforest reforestation project at Victoria Park Nature Reserve, northern NSW. In S. Phillips (ed.) Rainforest Remnants. Hurstville: NSW National Parks and Wildlife Service.
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- 69 First Annual Report upon the Occupation of Crown Lands [Branch] of the Department of Mines, New South Wales, for the year 1879: 166-7, 180-5.
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- 71 GG, 18 November 1914: 6962.
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- 73 GG. 25 June 1971: 2152.



# Introduction

Over a wide spread of time the actions of the variously named Government departments charged with stewardship of forest resources have attracted a whole range of criticisms from those of us who 'always knew their business better than them'. It has to be admitted that some of the complaints and criticisms have been misguided. There always have been a range of community opinions on what the aims and objectives were and should have been, for forest resources. The role of Government was an equally confusing set of aims. In settler societies such as Australia and New Zealand, the rhetoric of 'taming the bush' meant converting forest into 'productive' farmland. Such rhetoric enters official terminology. The solution to the squatting problem in the 1840s in New South Wales was found with the passing of the *Imperial Wastelands Act*. This solved questions relating to open access problems associated with public ownership. The classic problem of the commons, that of unrestrained access and use, is not, however, the underlying cause of the problems to be found with early public ownership and operation of the forest resources. If they had been, then the advent of the various government departments, forest services, commissions and other public bodies might have solved the problem. In fact since all such bodies developed a determined desire to set production forestry into the long term framework, generally through afforestation rather than sustained yield operations of old-growth forests, they created further distinct problems of their own rather than solving any original ones.

More recent complaints have centred upon a supposed lack of efficiency of operation on the part of public sector management, of too little commercial focus. Simultaneously others have been critical of too commercial a focus on the part of government and its neglect of the values of conservation, bio-diversity and

existence values, amongst other environmental aspects. Caught in the crossfire between the two camps, where were the foresters looking for a stronghold?

In an attempt to consider the question of what the underlying motives for the establishment of the 'new' departments were in the period after the First World War, this paper concentrates on the issues surrounding the establishment of the UK Forestry Commission. It also examines some of the motives for such bodies coming into being at that time. Some comparisons are made with the New Zealand and Australian situations, since the model appears to have been something of an Empire ideal as far as Forestry development was concerned, not least since the forest resources of the Empire continued to be viewed by Britain as essentially British. In fact such an attitude remained strong through to the 1960s and the operation of the sterling area and licencing to develop forest product industries in Australia and New Zealand, which focused on saving hard currency (US \$) for the area as a whole. New Zealand may have taken even longer to shake off the colonial apron strings not least through its desire to play the vulnerability card in British negotiations for their entry into Europe. Macmillan's 1962 reference to 'an English farm in the Pacific' (Singleton and Robertson 1997: 327) remained a pertinent view at either end of the world.

The first section of this paper contains an examination of the general background conditions, attitudes on appropriate land-use and how to control them as well as the appropriate role of government in this regard. The second section looks at these attitudes in terms of approaches to common property, to public ownership and to perceptions of conflict between the environment and efficient production. The third section looks specifically at some of the claimed immediate reasons for the establishment of the Forestry Commission and the Imperial associations, including the assumed timber famine and the strategic problems of Empire supply. The fourth section concludes the paper by looking at how successful and consiste the outcomes were when compared to the original intentions and aims.

# Background conditions, attitudes and the presumed role of government

Land-use was but one aspect of natural resource utilisation, albeit an overwhelmingly important one for Australian and New Zealand societies. In Britain there were different needs and different institutional arrangements as well as perceptions of different problems. Perceptions of imminent timber scarcity abounded and it was felt to be the role of government to do something to correct the situation. In Britain there were claims that such action was needed for strategic considerations, if for no other.

In a somewhat contrasting view, the colonial environment in the early twentieth century often resulted in the fall back position, if not the first expectation, being that government was expected to take a leading part in this process as it had with many other developments where private funds were found to be lacking. In terms of colonial society, Hawke has characterised three general areas of policy

approach with which the colonists anticipated government would concern itself. These were: first, to secure public order and to act as an agent of the community in securing overseas borrowing for development purposes against the security of its ability to tax; second, to accord preferential treatment to settlers over that afforded to foreigners; and third, to act as referee and alter outcomes reflecting the relative interests of internal groups within the colony (Hawke 1982:116). Britain would generally not have accepted nor followed all of these as satisfactory reasons or arguments, but in forestry and its related sectors and activities there were some areas of overlap in terms of policy decisions. There was also, as will be shown, a far more critical response and analysis of the resulting structures and institutions and their practices in the British case.

With respect to forestry activities specifically, the development of afforestation and subsequently sawmilling, especially of pinus radiata, through government action was well established in the antipodes. The South Australian Department of Woods and Forests had gone ahead with sustained milling activities from as early as the beginning of the twentieth century, arguing that it was necessary for it to do so since private milling was not forthcoming (Lewis 1988: 159). A few small casual operations milling radiata pine were also to be found elsewhere in Australia and New Zealand, but not leading to long term sustained output.

In Britain World War I had sharpened perceptions of the strategic issue. Even if supplies were available overseas there was still a problem in obtaining them through a naval blockade and submarine warfare in particular. Emergency afforestation was undertaken during the war itself, through an emergency afforestation account set up for the purpose (Forestry Commission Records 1915). Leaving the task to the market and private provision was seen as taking too long. That waiting for the fir and larch to grow from seedlings was equally problematic in terms of a short run problem does not seem to have occurred to proponents of the scheme, or if it did they found it an inconvenient problem and therefore one best ignored. As will be seen, the idea of the need for wide scale government involvement was to be critically reviewed by the 1920s, but even so the need for a direct government response was still felt to be overwhelming. This included the expressions of feelings in parliament that Great Britain could not be seen to be the only country in the world without a forestry department (Hansard, 1/3/1922: 444). This perceived need not to be seen as the odd one out whilst not in itself sufficient reason for the establishment of a forest service, was used as part of a range of arguments which claimed such a development as representing the way the world was moving. The implication was clearly meant to be given that this was the correct way to go.

In New Zealand the immediate post war era saw an estimated two thirds of the forest resources of the country already acknowledged as being under state control, through a system of what has been called 'bare regulation' (Roche 1987: 195). Experiments with price control negated any possibility of a market based solution and generally produced lower prices than otherwise would have been the case thus increasing the pressures to rapidly cut into existing stocks of standing timber.

A bureaucratic response was seen as needed to develop afforestation in response to a feared imminent timber famine. The establishment of the New

Zealand Forest Service was the outcome with emphasis on future production through exotics rather than best use or protection of existing indigenous forests. Australia saw a similar response with what Legg has called the custodial era of the late nineteenth and early twentieth centuries (1997: 303). His description of the activities of 'fledgling forest services' as moving generally forward towards a more concerned and protective regime for existing forests is somewhat questionable in the light of experiences in New Zealand and the United Kingdom. In contrast the current author has characterised the attitude displayed by foresters in this period as developing a global view that timber supplies needed to be conserved and that this was best done by some form of physical, direct bureaucratic control (Jackson 1991: 233). The idea that this was best is more the product of assertion than of argument.

The Forest Services appearance at about the same time in the case of all three countries can be seen as reflecting a particular and shared attitude to the appropriate way forward for controlling and regulating forestry activity. The similarity of approach in the British case does not demonstrate a direct link with any colonial socialism, which may have been exhibited in the antipodean response. Any such co-incidence was due more to fortune and a global view on the part of foresters than to any inevitable outcome of a growing universal belief in the value of socialist methods.

What had altered—in terms of the early exploitation of natural resources at this end of the world by the early twentieth century—was that this was now facilitated by greater knowledge. Even by the 1920s, however, it is still estimated that general expectations were too optimistic regarding the prospects for further rapid expansion, in Australia particularly, when compared to the reality of the situation (Jackson 1998: 3). Natural resources were not in a never-ending free supply, much as early European settlers might have wished or thought them to be so. Settlers might have some fears as to the finite source of such resources by the 1920s, but the attitude to their use remained a relatively profligate one.

# Common property, public ownership, environment and efficient production

Forests have been an important part of the New Zealand and Australian landscape and a contributor to economic activity ever since the start of human habitation, long though that is, as well acting as a major physical constraint upon economic development. Maori and Aboriginal methods of land management included the use of fire as a tool in shaping the environment to their purpose. The scale of clearance for agricultural and pastoral land was far greater once the Europeans arrived. At the peak activity levels in the late nineteenth and early twentieth centuries, the relative rate of forest clearance in Tasmania and New Zealand may well have reached rates comparable to those recorded more recently in Asia and Latin America.

From a situation in which standing timber was regarded as having little if any commercial value, events have moved in New Zealand through to the point where

during much of 1996, cutting rights to the holdings of the publicly owned descendant of the Forest Service were competed for in a vigorous manner, by at least three major bidders. The rise in ascribed value of those assets when readied for sale was sufficient to generate concern as to the viability of timber processing if such values were to be reflected in their input product prices. This suggests, amongst other things, that the price was too low in the first place. Greater value should have meant more plantings and more forest activity.

As Repetto and Gillis have noted for the general case, policies and attitudes to the value of existing forest resources have generally led to over exploitation from an economic perspective (1988, 1-2). Underestimation of the environmental and non-production values of the forest is a common feature of forestry activity and the partial view of the Forestry Departments with their concentration on production concerns and afforestation worsened rather than alleviated the problem. If environmental values were to be incorporated fully then an overall appreciation could have been attempted, but the thrust or prevailing ethos of the forest service type bodies as they developed in the 1920s appears to have been partial, leaving conservation and other non-production issues to different bodies.

In both Australia and New Zealand it was the push for clearance, largely for pastoral purposes, that produced over rapid depletion of existing resources. Alienated or not the land was cleared. Private ownership afforded no greater certainty of a rational decision, taking all forest values into account. Nor were open access and the supposed tragedy of the commons the underlying cause of problems in this respect. The call for 'improvement' in order to secure clearer title was a compounding problem. Clear title can in this instance be interpreted literally as well as legally, requiring the removal of forest cover from the land and its conversion to pasture. Open access with other control mechanisms would have potentially provided a satisfactory outcome. The British heritage of the commons, before enclosure, involved very restrictive and precise details of usage rights and practice. It was far from open slather and devil take the hindmost (Mingay 1997: 34-5). There was a range of alternatives which could have been tried to encourage production without involving Government Departments in production forestry and thus diverting them somewhat from other legitimate targets of concern, such as non-production forestry values.

Certainly production forestry fits in well with the tenor of the time. Not only was opinion moving in favour of state forestry, but what that entailed in terms of operational objectives had almost a universal similarity. Gifford Pinchot, European trained and representative of the then current way of thinking, is said to have had 'little interest in preservation' and to have instructed his foresters in 1907 to make sure forests were used for their most valuable purpose (Lehmann 1995: 39). The suggested range of valuable purposes deemed advantageous to National Forests included railways, roads, trails, canals, flumes, reservoirs, telephone and power lines as necessary infrastructure for development through opening up the country. Existence values and wilderness do not feature. The United Kingdom and Australian and New Zealand government forest service bodies appear to have held to a similar narrow ethos and concern. Control of the sector through

ownership was at least part of the aims and objectives. An unwillingness to condone foreign ownership, reflecting one of Hawke's three legitimate colonial society expectations of government was also part of the policy mix. Public ownership and efficient production came to be seen as primary goals.

Various problems associated with ownership have been raised generally in respect to conservation issues, access and entitlement to the forest and its products, across both time and space. Public ownership has been viewed in varying lights. Sometimes it has been lauded and regarded as necessary to protect forests from unrestricted predation by private interests. At the other end of the spectrum it has suffered extreme criticism, especially in its Forest Department guise, for its over concern with production forestry, leading to an undervaluation of the other products and benefits of the forest. In between it has suffered a good few slingshots from those who see public ownership as necessarily inferior in efficiency terms to private operations.

The problems in the early 1920s were an amalgam of those resulting from previous policy directions or lack of them and attitudes to the forest resources still available. Britain was heavily reliant upon imports. It remained not only the biggest importer of timber in the world, but timber itself made up the biggest component of British raw material imports by both value and volume through the inter-war period (Monopolies Commission 1953: 4). This gave some particular concerns to the Forestry Commission which somewhat distinguish it from its antipodean counterparts.

# Forestry Commission, timber famine and strategic problems

The terms such as 'Forest Departments' and 'Forest Services' have sometimes been used here generically rather than in strictly accurate fashion. As noted above, these variously named entities all shared some common characteristics, including the fact that until the recent past they remained in public ownership regardless of their changes in name or function. All of them generally held to a belief in afforestation and production forestry leaving conservation and scenic issues to others. In Australia there were several such bodies in the various states and the preceding colonial entities before 1901. In New Zealand the New Zealand Forest Service, followed on from the previous departmental structure. In the United Kingdom it was the Forestry Commission.

Problems with the overall reliance upon imports distinguished the United Kingdom from Australia and New Zealand. Whereas New Zealand had traditionally traded its surplus softwood for Australian hardwood, the United Kingdom suffered from an absolute need to import supplies of both types of timber. By 1914 Britain had virtually the lowest proportion of forest of any European country (approximately four per cent of the land area) and could supply only a small proportion of its needs from its own forests (Neale 1925: 321). Both World Wars created extreme difficulties of immediate supply as a consequence. It is tempting to suggest that the Forestry Commission actually came into being because of the

activities of German submarines! The submarine campaign may have been a catalyst, but there was more to it than that. A strong push for the establishment of a government operation to engage in production forestry to fill the gap in import shortages was a direct derivative of the wartime shortages. Little if any consideration appears to have been given to alternative strategies such as the possibility of building up a strategic stockpile which would have been quicker to accomplish and possibly cheaper in the long run than expanding the area under forest. Another possibility was looking for and encouraging substitute materials for wood, which in the longer term the market dictated anyway, such as steel and concrete in structural building work, and plastics and aluminium in finishing materials. Or the problem could have been alleviated by rather more efficient use of what timber supplies there were.

The most critical need was perceived to be pit props for coal mining in South Wales. Building needs in the south-east of England could have been added for peacetime needs in the 1920s and 1930s, but neither need was going to be fully or efficiently met by the operations of the Forestry Commission. What the Forestry Commission could contribute to any future such crisis forty to eighty years after its founding was likely to be limited. The plantings were largely concentrated in remote areas, such as Northern Scotland, because land was cheap rather than for any sound logistical reason. Transporting supplies from such areas to the areas of possible demand and need was not an optimal process. This problem was foreseen in the original intentions of the policy which was to acquire land for planting which was near to centres of industry, or within five miles of water or rail transport facilities (Cabinet papers 1922, 21/2, item 3). Unfortunately the policy appears to have been forgotten, or altered, so that the aim was not one of efficiency. Maximisation of production rather than maximisation of returns, was the prime objective. Maximisation of production also could lead to a neglect of social concerns including environmental ones. Cheap land rather than the most suitable land was looked for, much of it poor sheep land which the owners were keen to get rid of. One by-product of this process was that at one point the Commission was reckoned to be the biggest sheep owner in the country, an outcome not envisaged in the original proposal.

By the early 1920s the Forestry Commission was not only established and operating, it was becoming a significant economic actor in its own right. The Commissioners were described as enthusiastic and public spirited, but engaged in an undertaking which was always going to return a heavy loss and would only show a return over a very long period, one estimated to be in the order of eighty years. A lack of trading experience was revealed in its name; the Forestry Commission being modelled on the Charity Commission and the Church Commissioners! The inquiries of the Geddes Committee, which was looking for an efficient operation, not surprisingly eventually recommended that:

after full consideration of the circumstances, we are of the opinion:-

- 1. That the scheme of afforestation by the State should be discontinued.
- 2. That the vote of £275,000 for 1922/23 should not be allowed and that steps should be taken to cancel the power to spend the remaining

£2,822,000 of the total of £3,500,000 authorised under the Forestry Act. 1919.

3. That any unspent balance in the Fund should be surrendered to the Exchequer after meeting any liabilities accruing in 1922/23 in respect of timber survey

(Geddes 1922: 54).

The thrust of the Geddes Committee's critique was to suggest that the operation was inefficient and should not be continued in times of financial stringency. The original arguments that private sector provision had failed previously in terms of poor quality as well as quantity of product (Cabinet papers 1922, 21/2, item 3) were not addressed. Essentially supplies from overseas would fill the gap in peacetime and the strategic arguments were left hanging. The comparison between the relative merits of public or private production was not fully tested either. A mix of objectives was the biggest problem for the organisation. As the objectives became more settled, however, extending the degree of control of the production side of forestry became dominant. The area planted set the standard with much talk of the difficulty, if not impossibility, of forecasting returns over growing regimes of up to eighty years and, by implication, returns should therefore be neglected. Similar outcomes can be seen in New Zealand and Australia where state foresters exhibited an antipathy towards privately owned operations, seeing them as competition, not as co-partners in achieving national goals.

Attempts to restrict government expenditure were also a common feature of the time. Bureaucratic central control was not sensitive to market pressures. Costcutting and budget restriction were the only tools available to governments faced with other issues of more pressing concern. Forestry as a source of employment for the unemployed was mooted in the United Kingdom as early as 1922 although successfully resisted as not an efficient way to proceed. The idea reappeared in all three countries almost ten years later and added yet another target to the list of what production forestry could do.

The strategic argument was only finally abandoned in the United Kingdom as recently as 1957 with the publication of the Zuckerman Report. This basically suggested that any nuclear war would be of short-term duration, submarines were still a threat but in a different manner and outweighed by the threat of land based missiles. Up to that point a reserve stock was called for and that reserve stock was to be in the form of standing timber not a physical stockpile.

Famine in terms of imminent timber shortages was widely predicted for the entire post-war world. India, South Africa, Australia and New Zealand were all written off in British official thinking as 'already softwood importers and therefore unable to provide relief with regard to future supplies, but rather their demands would increase the problems (Reconstruction Committee 1917: 19). These predictions never arrived. Imports into New Zealand increased significantly after the end of World War I, but really only because they were artificially held back during the war itself. Hardwoods such as jarrah and ironbark met a particular need, which could not be supplied from local sources. To quote the New Zealand Official Yearbook:

New Zealand exports white pine (kahikatea, Dacrycarpus dacrydiodes) for butter boxes and kauri (Agathis australis) for furniture, but imports Oregon pine for building, and hardwoods, mainly jarrah, for building and for railways. But sooner or later there is bound to come a demand for high protection to develop the untouched resources of New Zealand (cited by Condliffe:1915: 867).

Concerns for likely shortfalls in output in New Zealand and the need to conserve stocks for domestic supply led to quantity restrictions on all exports, except kahikatea, lasting through to 1928 and to the establishment of the New Zealand Forest Service along the lines of the plan outlined by Macintosh Ellis in 1920 (Roche 1990: 179, 196-7).

The major problem for potential New Zealand timber exporters in the 1920s appeared to be one of lower than expected growth in demand from overseas and consequent low price and profitability, especially from the end of the decade. Canada was the alternative Empire supplier to the United Kingdom not New Zealand. Although the talk was of Empire at Imperial Forestry and Trade conferences in the 1920s, the United Kingdom sought to replace its traditional Russian and Scandinavian imports with supplies only from Canada so that the impacts of any world shortages were unlikely to have much effect in New Zealand.

## **Conclusions**

Forest policy in Australia, New Zealand and the United Kingdom from the midnineteenth century through to the nineteen eighties was economically distorting. The appearance of the forest service bureaucracies in the particular form they took, just after the end of World War I, did not materially alter those distortions. They may in fact have increased them in some respects. There was a lack of clarity both initially and subsequently as to the real purpose of such bodies, a number of agenda being run and some capture by various interest groups along the way. What seems to have evolved was a forestry culture which saw afforestation, production forestry and moves towards concentrating on a few exotic species as the correct way to proceed in an industry dominated by publicly-owned enterprises. Fears of timber famine in general and wartime shortages immediately were used to push for production forestry development by the state, neglecting more than somewhat the alternative values of the forest estate.

Tax policies and incentives for clearing indigenous forests emphasised a move towards clearance for agriculture in the case of Australia and New Zealand with monocultures largely replacing indigenous timber. In the very recent past this ethos has been replaced with the sale of state cutting rights and a more market approach, although investment and other tax incentives are now starting to reappear, with investment horizons being seen as too long for government not to intervene. Questions of social returns, the interests of future generations, environmental and other more general policy issues have not been fully brought into the equation now any more than in the 1920s.

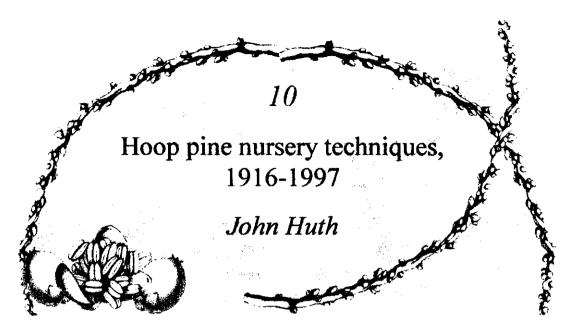
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# Managing





#### Introduction

The first silvicultural experiment conducted by Forestry Officers in Queensland was in 1876 on Fraser Island. In January 1882 a nursery was built on Fraser Island primarily for the raising of kauri pine (Agathis robusta) seedlings. However, despite limited success of establishing trial plots on Fraser Island there was no great interest in the establishment of plantations. In 1906 the Department of Lands was not in favour of large-scale reforestation by planting. The Director at the time preferred a system of conserving the forest using natural regeneration rather than the establishment of plantations for,

Such a system if attempted under existing conditions, could only result in a dismal failure, which would do much to throw discredit on forestry generally, and be productive of more harm than good (Department of Public Lands 1906).

In the same year the Director suggested that forest nurseries be established to supply 'Divisional Boards, State Schools, Municipalities, and other public bodies as well as approved private persons' with trees for planting by roadsides, in school reserves, in public places and on streets. In these nurseries, seedlings were transplanted from the scrub into the nursery bed or seed collected and sown. It was not intended that these nurseries provide plants for departmental use.

In 1908 the Department was still reluctant to try plantation production beyond the experimental stage. It was suggested that money would be better spent improving the natural forest. The possible threat of insect and fungal pests invading the plantations was also suggested as a reason not to embark on large-scale plantation development (Department of Public Lands 1908).

The appointment of N.W. Jolly as Director of Forests in 1911 saw the commencement of a series of experimental plantings on Fraser Island. Species planted in these trials included red cedar, cypress pine, hoop pine, bunya pine and several exotic *Pinus* species. In 1913 a nursery was built on the island for raising open-root hoop pine for planting in sections of the forest that did not contain hoop pine. The first planting of hoop pine on Fraser Island was in 1915. Later, the establishment of an experimental station at Imbil was considered of fundamental importance in testing the feasibility of establishing softwood (hoop pine) plantations. This station was built in 1916 and in 1917 two hectares of experimental plantation of hoop pine, bunya pine and several exotic pine species was established at Stirlings Crossing.

Prior to this, hoop pine plantations were established by liberating natural regeneration in the scrub by cutting down competing trees. This method was followed by simply transplanting hoop pine seedlings from the scrub into openings in the forest or transplanting them into cleared lines (or rows) in the scrub. Swain records the first attempt at planting seedlings in this way:

For silviculture in South Queensland, in 1917, there was an old age pensioner at Imbil in the Mary Valley, commissioned to plant suppressed hoop pine striplings open root into an open area of destined plantation plots (Foote et al. eds).

The first nursery built specifically for the raising of hoop pine seedlings in Queensland was established at Stirlings Crossing near Imbil in 1917. A bullock driver 'with natural instincts for trees' was appointed as the first nursery overseer. The planting stock for the first plantations in the Imbil area were dug up from the scrubs at Noosa, transplanted in nursery beds and kept there for 12 months before being planted as open-root stock. The technique of planting hoop pine as open-root stock was first used on Fraser Island. Given the nature of the sandy soils on the island the possibility of planting open-root hoop pine was not unrealistic. However, survival rates in the heavier soils of the mainland were not as impressive. As survival was poor due to periods of drought it soon became clear that a major change in the nursery technique of raising hoop pine seedlings was required.

#### Location of nurseries

Nurseries were established close the areas set aside for hoop ine plantations for two reasons. First, it was thought that if seedlings were raised in one locality and then transferred to another, they might be adversely affected by the change in climatic conditions. Second, transport facitlities simply did not permit the transportation of large numbers of tubed seedlings. During the 1916 to 1997 period, there were 28 nurseries at different locations in south-east Queensland. Where the plantations were small, local nurseries were operated for only a few years. The number of nurseries was rationalised during the late-1960s and hoop pine production limited to five of the larger nurseries at Kenilworth, Yarraman, Gallangowan, Benarkin and Brooweena. The nursery at Benarkin operated the longest, for 77 years (1920-1977). Their location is shown in Figure 1.

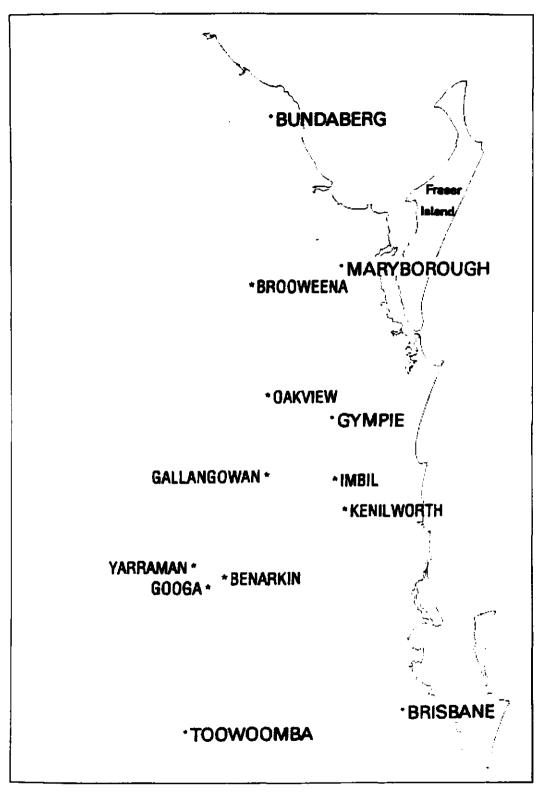


Figure 1: Location of nurseries

# Planting tube

The solution to the poor survival of open-root planted stock came in 1922 with the invention of the 'improved propagating tube'. This device was described as:

a tube or cylinder without a top or bottom, made of sheet tin, galvanised iron or other suitable metal of light gauge of any desired diameter, preferably from half an inch to six inches [1.3-15.2 cm] and of different lengths, say tube is a sheet of galvanised iron to various dimensions (Anon 1924).

It became known as the Weatherhead tube after Fredrick Weatherhead who patented the tube in 1924. However, at least three other men—Walter Petrie, Jules Tardent and Jack Innis—contributed to its design.

The principal Forestry officers at Imbil in the early-1920s were Walter Petrie (previously a Forest Officer on Fraser Island), Fred Weatherhead (previously from Victoria), and Harold Swain who was the Director of Forests. Jack Innis was the nursery overseer. Sometime in the early-1920s (possibly 1923) Deputy Forester Weatherhead was transferred to Benarkin, with the responsibility of establishing a Forest Station and nursery. At the same time Jules Tardent was appointed as Silviculturist at Benarkin.

Rolo Petrie (1995) states that his father Walter experimented with a method of growing hoop pine in tubes. Nine-inch sections of four inch-galvanised pipes were pushed down over the seedling in the nursery while the sand in the bed was wet. The tube containing the seedling was then dug up and stood in rows in nursery bays. The seedling was planted by placing the tube containing the seedling in the planting hole and the tube pulled over the top of the plant.

Jules Tardent (1982) describes a propagating method that his father used for raising tomatoes on a Government farm at Biggenden in the early-1900s. His father used sections of unsoldered pieces of tin that he tied together with string as a planting tube.

As Weatherhead was the senior officer at Benarkin at the time, he would have been responsible for any correspondence on the subject of the planting tube. He was an innovative and enterprising man and moved to patent this tube in 1924. There was a difference of opinion between Weatherhead and the then Queensland Forest Service as to who actually owned the patent on the tube. The Forest Service argued that since they employed Weatherhead they owned the patent. In the end Weatherhead was paid £50 for the patent. His daughter, Dulcie Dent (pers. comm. 1998), suggests that this was a substantial sum on top of his wages and helped pay for a new Hupmobile.

# Tube design

During the experimental phase of its development the metal planting tube existed in various forms. Although there is a lack of written evidence, it has been suggested that small sections of bamboo were used as a forerunner to the metal tube. Timber veneer tubes were also used to some extent. These were about the same size as the metal tubes; rubber bands were used to keep the tube together.

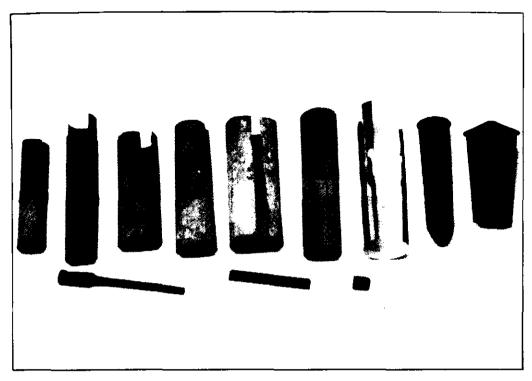


Figure 2: Types of metal tubes. Clips were made using one of the three tools.

The first tube consisted of two circular pieces of metal each about 18 cm long. The use of two sections of metal and a ring of some kind to keep the tube together proved cumbersome. The first 'one-piece' tube was fastened together with a circular band of tin. In some instances, string, wire or a metal ring was also used. These fastening devices also proved to be inefficient. Hence the need to improve the fastening device. In the tube designed by Weatherhead, the fastening device consisted of a small hole on one edge and a stamped out clip on the opposite edge. 'The clip on one edge is passed through the opposing edge and inserted in the square hole when it springs into locking position'. Another design consisted of a hole punched near one edge and a small piece of metal soldered on the opposite edge. The small protruding section was simply pushed through the hole. Jack Innis is credited with designing the clip that was used from about 1925. The clip was made by folding a small section of opposing edges in opposite directions. The fastening device designed by Innis proved to be a boon for the future of the planting tube. The clip as originally designed was only about 2 cm long. The length of this clip was later increased to 4 cm.

Until 1925 the tube was 15 cm long. At this time the length of the tube was increased to 20 cm to accommodate the long taproot of transplanted stock. This length was used until the demise of the planting tube in 1998. Since its invention, the diameter of the tube remained unaltered at 4 cm. The volume of soil in the 20 cm tube was approximately 250 cm<sup>3</sup>.

The first metal tubes were made of 30 gauge galvanised iron. Research trials testing the use of other materials—lead-plated tubes and softer tin-plated tubes—found that the seedlings grown in the galvanised tubes had a much better root

system. The roots of seedlings grown in the tin-plated tubes were dominated by long light brown lateral roots that made contact with the tube surface. This contrasted with the root system of seedlings grown in the galvanised tubes. The zinc in the metal acted as a chemical root pruner resulting in a large number of shorter roots. However, the use of the galvanised tube resulted in high levels of zinc in the hoop pine stand-down beds. The use of the heavy galvanised tube also made tubing a very onerous task. Despite the galvanised tube having a usage life of 10 or more years compared to 3-4 years for the tin-plated tube a change was made in the early-1970s to the use of the softer tin-plated tube.

#### Tube manufacture

Sheet metal of the appropriate size (20 cm × 15 cm) was rolled into tubes on Departmental owned rolling machines. These machines were initially powered by hand or machine. In some cases, a motor bike supplied power to a rolling machine. The clip was made by hand using a simple device invented by Jack Innis. This involved manually turning out a small section of metal on one edge of the tube and turning in a section on the opposite edge. In later years H.M. Prison staff supplied the tubes without the clip. From about 1970 the tin-plated tubes complete with the clip were supplied by a commercial manufacturer.

# Propagation technique

After it proved difficult to establish hoop pine plantations using open-root planting stock, a change was made to sowing the seed directly into metal planting tubes. In Weatherhead's patent of 1924 and in the Forest Service's *Annual Report* of 1922 the method of raising hoop pine seedlings is described in this way:

In using this invention, the tubes are placed vertically on a suitable stand, filled with suitable compost or loam and either seed sown or small plants pricked into the earthern core.

This technique proved to be unsuccessful and in 1924 research was commenced to find a better method of raising hoop pine nursery stock. By 1926 the technique was altered to growing the seedlings in open-root beds for a number of years before transferring them to metal planting tubes.

The main elements of this unique nursery technique are seed supply, a suitable water supply, the requirement for shaded nursery beds, sowing, thinning, root wrenching, the transfer of young seedlings to metal tubes (tubing) and dispatch to the field. Each element is described in what follows.

Due to the high cost of nursery production the possibility of planting hoop pine as open-root stock was reinvestigated in 1936. The results of research trials concluded that it was possible to plant open-root stock provided they were well conditioned and field conditions were ideal. However, given the unreliability of summer rainfall better results were achieved by planting tubed stock. In the late-1970s for similar reasons the possibility of planting open-root stock was reinvestigated. The results were the same hence the adoption of a container system for raising hoop pine planting stock.

# Seed supply

As hoop pine does not produce a viable seed crop at regular intervals the supply of seed is not always guaranteed. Good crops only occur on average once every five to seven years. In some instances it may be 10 years between good crops. To overcome this problem, young (up to five years old) seedlings, 5 to 15 cm tall, were dug up in the forest and transplanted into nursery beds. Seedlings from the Tewantin/Noosa area were transplanted into nurseries at Imbil and Oakview (near Kilkivan). A year later these seedlings were planted in the field.

#### Seed collection

Initially seed was collected by Forestry staff or by private collectors who were paid for seed collected from trees that had been cut down. The 1928-29 *Annual Report* of the Queensland Forest Service reports that:

As every seed carries the characteristics of its ancestry, the Forest Service made sure of one of the parents by gathering its seed supplies only from carefully selected individuals yielding ply quality log.

Until 1952 all plantations were established using seed from large trees of good phenotype from natural stands. From 1952 to 1979 seed was collected from Seed Production Areas—heavily thinned areas in the plantation that contained trees of good phenotype. Since then, seed has been obtained from seed orchards that contain superior individuals selected from plantations planted prior to 1952.

## Seed storage

After collection the seed was dried in the sun, packed in charcoal lined containers and stored in a cool place. Swain (1924) comments that the seed will not remain viable for more than a year. He suggested that the seed could be kept for a longer time in a mixture of forest mould and sand. In 1926 a trial was conducted testing several different storage techniques. The storage environments were dry scrub mould, charcoal and hermetically sealed drums. The storage in dry mould gave 'splendid' results after 22 months in storage. In 1933 the results of a cold-storage trial concluded that hoop pine seed could be stored for four years at 4°C without any loss of germinative capacity. The results of a long-term storage trial indicated that hoop pine seed retains its viability for up to 8 years if it is stored in sealed containers at between -9.4°C and -15°C (Shea and Armstrong 1978). Since this time hoop pine seed has been stored at -15°C.

## Shade

The results of research trials found that hoop pine seedlings need to be covered by some type of shade for at least the first six months of their nursery life. Shade is necessary to protect the young seedlings from sunburn and from frost. Both low shade and high shade nurseries were used.



Figure 3: Low shade nursery at Imbil in the early-1920s. Note the use of timber off-cuts for shade.

In the low shade nurseries, timber or sarlon provided the shade. In the first nursery at Imbil timber flitches were used for shade. This was later changed to light hardwood slats  $7.5 \text{ cm} \times 1.5 \text{ cm}$  and 1.2 m long—the width of the nursery bed. Widening the gap between the wooden battens gradually decreased the intensity of shade. The shade was completely removed by age 18 months.

The high shade nurseries were more substantial than the low shade ones. The complete nursery was covered in shade provided by slightly larger sized timber slats. The height adopted for these nurseries permitted the entry of vehicles and enabled weeding and other nursery operations to be done without the removal of timber slats. The density of shade (about 50 per cent) remained unaltered.

In 1987 the timber slats of the high shade nursery at Benarkin were replaced with sarlon that could be removed. Also, the height of the shade was increased to permit the passage of tractors to carry out mechanical bed preparation.

## **Sowing**

## Bed preparation

To permit good drainage the nursery beds were raised above the natural surface of the land. The nursery beds were edged with timber. In later years the timber was removed and the beds raised by a bed-forming device mounted on the back of a tractor. As soon as possible after the removal (lifting) of the seedlings the beds which were to be sown were dug to a depth of 20 cm using a spade or a digging fork. The beds were allowed to lie fallow for a short time before being dug over again. At this last digging the ground was worked to a fine tilth and if required

farm yard manure was worked into the top 10 cm of the bed. During these diggings all weeds were removed by hand. Just prior to sowing any weeds were removed and the surface of the bed levelled using a steel rake. The presence of boards along the edges of the nursery bed did not permit the use of machines for bed preparation. When the Brooweena nursery was built in 1964 it was designed to allow the use of machines for bed preparation and other nursery operation. The first machine to be used in a bed preparation operation was a walk behind rotary hoe in 1966. This was followed by a tractor mounted rotary hoe being used in selected beds in the Kenilworth nursery in 1968.

#### **Fertilising**

The main fertilisers were decomposed farmyard manure or filter press. As these products were not sterilised they were the main source of weeds in the nursery. The most common weeds were nut grass (Cyperus rotundus), white root (Lobelia purpurescens) and pig weed (Portulaca oleracea). Bagasse (a sugar cane based product) was also used as a fertiliser. More commonly, it was often cheaper and more efficient to simply remove the soil from the bed and replace it with fresh soil. In later years, the nutritional status of the soil was improved by growing oats as a cover crop and mulching the stubble into the soil. Since the mid-1970s chemical fertilisers (di-ammonium phosphate and ammonium sulphate) were used as a replacement for the organic fertilisers.

#### Method of sowing

Hoop pine seed was sowed in spring, usually late October or early November. The sowing rate was determined by viability of the seed. There were two methods of sowing, drill sowing and broadcast sowing. In the drill sowing method the seed was placed in small channels, 2 cm wide, 1 cm deep and 20 cm apart. For broadcast sowing the seed was spread on the surface of the nursery bed. In both cases the seed was covered with about 1.5 cm of decomposed hoop pine sawdust. In high shaded nurseries the sowing density was 195 seeds per m<sup>2</sup> (39 per bed metre) and in low shaded nurseries the sowing density was 171 seeds per m<sup>2</sup>.

The presence of a large papery seed wing covering the embryo of the hoop pine seed makes mechanical sowing of the seed difficult. More recently Huth and Haines (1995) found that the wing could be removed without damaging the seed or affecting its viability of longevity. However, due to the large size of the seed it has not been possible to sow hoop pine seed with mechanical sowing machines.

#### Weed control

Until the late-1960s all weed control was done by hand. In the high shade nurseries cultivation of the inter-row acted as a weeding operation. Lightweight handheld hoes were specifically designed for this purpose. In low shade nurseries all weeds were manually pulled out of the ground. White Spirit—a petroleum based product—was used as a post-emergent weed control agent. Since the mid-1970s, a number of chemicals have been used as pre-emergent and post-emergent herbicides

#### Water

Water was obtained from a variety of sources. The most common source of water was from wells dug by hand and lined with slabs of timber. In many cases these wells were very deep. For example, the well at the Googa nursery was 66 m deep. Water was also obtained from dams, creeks, railway tanks and the local town supply. The water was pumped into overhead tanks built on high stands which enabled gravity to pressurise the watering lines.

Until about the mid-1960s all watering was by hand. Simple sprinklers followed this and later efficient locally made overhead sprinklers were used. In some cases watering was by irrigation lines laid on the surface of the beds. Once germination was completed the beds were watered regularly to ensure that the soil remained moist. Also, the fallow beds were well watered to encourage the germination of weed seeds prior to sowing.

# **Thinning**

This operation was done when the seedlings were six months old. It involved removing seedlings by hand to reduce the incidence of clumps and to retain the more vigorous seedlings. In drill-sown beds the density was reduced to 130 per m<sup>2</sup> (26 per bed metre) and in broadcast beds to 120 per m<sup>2</sup>.

# Root wrenching

It has always been known that the best way to limit the shoot growth of seedlings is to limit root growth. Root wrenching is the term used to describe the cutting of the tap and lateral roots thus producing a conditioned seedling. When the first hoop pine was planted as open-root stock it was planted as unwrenched stock. The root wrenching was actually done at planting. Root wrenching was first introduced into hoop pine nurseries with the adoption of the tube. Swain (1924) described the tube as a 'transplanting vehicle'. When the seedling was tubed its root system was disturbed thus causing the seedling to be 'set back' in its growth. However, as this one-off control of root growth proved to be insufficient in limiting height development the seedlings (7.5 cm tall) were placed into trenches (transplant lines) in transplant beds six to nine months after sowing at a spacing of  $10 \times 10$  cm. A transplant board was used to assist in keeping the plants upright and in maintaining correct spacing between the seedlings. The seedlings remained in these transplant lines until they were transferred to the tube.

In 1924 Swain introduced a detailed nursery recording system. He requested that the ages of the stock be recorded in a particular way. The age was recorded as three numbers separated by dashes, e.g. '6-12-9'. The first number being the number of months that the seedling spent in the nursery bed, the second being the number of months in transplant lines and the third being the number of months in the tube.

As it was found that these conditioning treatments were insufficient to control plant development an additional root wrenching was done. This arduous task was done by pushing a sharp shovel into the soil at an angle of 45 degrees. The taproot was severed at a depth of 15 cm below the surface. The presence of soils with a high clay content caused the soil to stick to the spade. This was especially the case at the Yarraman nursery. To overcome this problem a root-wrenching board was used. This board was 3 m long (the width of the nursery bed) and 20 cm wide and contained a 45 degree slit 15 cm from one edge through which the shovel was inserted. The slit insured that the correct cutting angle was used and removed the soil when the shovel was pulled back through it. Also, a hinged handle was fastened to the board. This was used to push the seedlings down enabling the operator to walk between the drills.

With the adoption of mechanical root wrenching machines broadcast sowing was re introduced in the Kenilworth nursery in the early-1980s. In this case a reciprocating blade undercut the root at a set depth two or three times prior to tubing. The first wrenching was to 12.5 cm and was done in September of the year following sowing. Successive wrenchings were at depths of 15 cm and 17 mm at six to eight weekly intervals.

## **Tubing**

The four main activities associated with tubing are: lifting the seedlings from the nursery bed; grading them into size classes; 'tubing' them by placing them in metal tubes filled with soil; and 'stand down' by placing the tubed seedlings in an area to await planting.

Tubing was done traditionally in July to August and the seedlings planted in November to December. In the early-1980s the planting window was changed to October to November and tubing was done in May to June. Ideally the plant required 10 to 13 weeks in the tube prior to planting to re-establish a lateral root system and for that root system to bind the soil in the tube. Minimal deaths were recorded if at the time of tubing the plants were in a dormant stage and slightly hardened by several light frosts.

The main centre of activity for the grading and tubing of the seedlings was the tubing shed. This shed was usually a simply built open structure that contained a bench at which the workmen stood to grade and tube the seedlings. The shed was built within the confines of the nursery. However, in 1926, some tubing was done in temporary nursery depots at the planting site. This practice was initiated to reduce the cost (5s to 7s per acre) of transporting the tubed plants to the planting site. The nurseries were constructed of 'bough sheds and open lean-tos with iron roofs and 1000 gallon 4,500 litre tanks'. These smaller temporary nurseries did not last for many years. The activities were described in the 1926 Annual Report of the Queensland Forest Service in following way:

To these plantation depots come the untubed transplants from the central nurseries and here they are tubed with a soil mixture compounded upon the spot, which saves the previous cost of useless earth cartage in tubed plants...

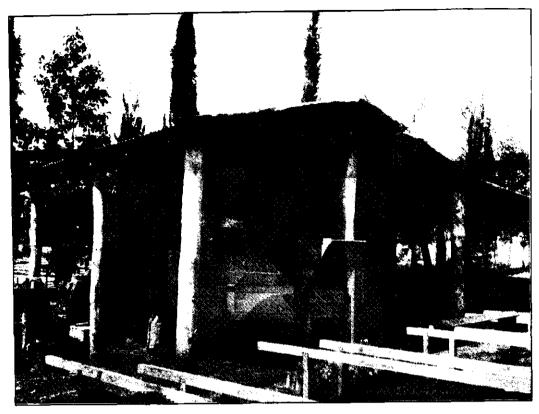


Figure 4: Tubing at the Yarraman nursery, 16-18 months after sowing, c.1930

The design of these sheds at the central nurseries remained unaltered until several new sheds were built in the early-1970s at the Gallangowan and Yarraman nurseries. As tubing was done during winter, the working conditions were less than ideal. Electric heaters were installed in these new sheds and in the tubing sheds at Kenilworth and Benarkin. Prior to the installation of electricity and the use of electric heaters, the sheds were warmed by open fires lit in 20 litre drums or large kerosene heaters.

#### Lifting

The plants were removed from the nursery bed usually by two men, using a digging fork, a spade or a modified spade with a section about 10 cm square cut out of it. This hole allowed the dirt to fall away from the roots of the plants. Water was applied to the bed to ensure that little damage was done to the root system of the plants. Once removed from the bed the plants were placed in a wheelbarrow (initially the plants were placed in cut out kerosene tins), covered with wet hessian and taken to the tubing shed. To enable larger numbers of seedlings to be handled, a large flat-topped wheelbarrow was designed by J.T. Innis in about 1940. This became known as the J.T. Innis wheelbarrow and was adopted by most nurseries. It was still used in the Kenilworth nursery until it closed in 1997.

When machinery was used the seedlings were slightly lifted out of the bed by passing a solid bar under the soil surface at a depth of 17 cm. However, the actual removal of the seedling from the bed remained a manual task.

#### Grading

On arrival at the tubing shed one or two workmen using a grading board assessed all plants as to their suitability for tubing. This was simply a board or rack with a division in it that allowed seedlings in each size class to be kept separate. Unacceptable plants [spindly, poor vigour, poor root system, double leader, those too small (under 17 cm) or those too big (over 60 cm)] were rejected and classed as culls and were thrown on the floor of the tubing shed. Usually the one man was responsible for the removal of the culls. Those acceptable were graded into classes according to stem height and diameter (Table 1). The tap and lateral roots of acceptable stems were trimmed back using a pair of hand shears to prepare them for the tubing operation.

Table 1:	Grading	standards	for	hoop	pine	seedlings
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Grade Designation	Height (cm)	Minimum diameter (cm)			
3	17 - 25	3.5			
2	25 - 35	4.0			
1	35 - 48	5.0			
L	48 - 60	6.0			

#### **Tubing**

The nursery overseer usually found the source of soil on the local reserve. It was imperative that the soil was not gritty and that it did not stick when moist. The soil was sieved (usually by junior labourers) either on site or in the nursery.

There were two acceptable techniques for tubing; tubing from the top or tubing from the side. In the former method the tube was firstly clipped together and the roots of the seedling pushed into it from the top. The seedling was pushed in and then pulled out a little to straighten up the lateral roots. The tubers put (dibbled) soil into the tube around the lateral roots. The tubers eliminated air pockets within the soil core by compacting the soil with their fingers. The soil in the bottom of the tube was pressed into the tube resulting in a small soil-less space in the bottom of the tube. This gap was filled with soil when the tube was placed into soil in the stand-down beds.

In the side tubing technique, the tube was opened up and laid on the tubing bench. Soil was pulled into the tube and a small trench made in it with the fingers. The seedling was then laid in this trench, ensuring that the cotyledon was above the tube. The roots were covered with soil and the tube was closed using a twisting action. Extra soil was placed around the top of the tube. The tube was forced into soil on the tubing bench to ensure that the bottom of the tube was filled.

The side tubing technique was used in the majority of the nurseries until their demise. There were usually five to seven tubers in each tubing shed. The average tuber processed between 800 and 1200 plants a day. Permanent employees normally did tubing; however, in latter years it was done on a contract basis.

In the early days the tubes were retained close to the tubers in bags, kerosene tins or rubbish bins. More recently the tubes were kept on a shelf within easy reach of the tuber. One man was responsible for keeping the tubers supplied with

tubes and for replenishing the tubes on the shelf from the stockpile that was kept undercover close to the nursery shed.

After the plant was tubed it was placed in a specially designed plant-carrier tin  $(25 \times 25 \times 15 \text{ cm})$  that held 25 plants. In some cases the tin was carried by a wire handle. More commonly, it was carried by turning it on its side and slipping the four fingers between the tubes and one side of the tin. A tin of average size plants weighed approximately 18 kg. In the early years, small wooden boxes or cut-down kerosene tins were used as plant carrier tins.

#### Stand down

There were two main stand down methods. At the Kenilworth nursery, the stand down beds were well watered before the tubes were put in place. The tubed seedlings were pushed into the soil to a depth of at least 5 cm. Boards or string lines were used to keep the rows of tubes straight.

At other nurseries trenches were dug to a depth of 5 to 7 cm and the seedlings placed into the trench. The author recalls standing down plants in the Gallangowan nursery in 1973. At this time a board 20 cm × 2.5 cm × 3 m long was used as a guide to keep the stand down rows straight. The board was placed across the bed and a trench made beside it using a planting grubber or a narrow shovel. During the trench-digging operation, half of the soil was placed on the board and half on the ground. After placing one row of tubes into the trench (5 tubes at a time) leaning slightly away from the board, the tubes were stood upright with the use of a batten about 1 m long. At the same time the loose soil was pushed in around the tubes and the soil lightly rammed. Then, the board was tilted so that the soil on it fell into the gaps around the tubes. The board was then used to ram the dirt into the gaps around the tubes. In most cases two men were able to stand down for five to seven tubers.

It was necessary to slightly lift the tubes at regular intervals to prevent the root system from growing out of the tube and into the soil in the stand down bed. In latter years tubed plants were retained in the carrier tins or newly designed wire baskets. The tins were placed on a bed of crushed gravel.

Until about the mid-1960s, all stand down beds were under shade and the plants remained there until planting. As the nurseries expanded the area set aside for standing down was used as bed space. Consequently the stand down area was moved outside of the shaded area. The tubed seedlings were covered with shade cloth for one month after tubing. The plants were watered as required.

# Cartage

Until the early-1970s all tubed plants were carted in the nurseries on flat-topped wheelbarrows (J.T. Innis). Then, small, motorised trolleys ('Power Ponies') capable of carrying 24 tins of plants were used extensively in the nursery. In later years small utility trucks were used.

Before motorised transport was available, tubed plants were transported to the field using horse drawn slides, drays or duckboards. In 1924 Jules Tardent

designed a special double-deck frame that fitted on the back of a Model T Ford truck (Tardent 1982). As young hoop pine is very prone to wind damage all stock was transported in covered vehicles. Semi-trailers were used where the stock had to be transported for long distances.



Figure 5: Dispatching plants from the Amamoor Nursery c.1930

#### Pests and diseases

Hoop pine is relatively free of major pests. The main pests that cause damage are white grub, grasshoppers, cutworms, and mealy bugs. White grub—the larvae stage of the Christmas beetle (*Rhopaea magnicornis*)—is the most serious nursery insect pest of hoop pine (Brown and Wylie 1990). Its activity was controlled by the application of persistant chemical insecticides to the nursery bed just prior to sowing. In recent years a soil insecticide was used only when the attack was noticed. Grasshoppers and cutworms (*Agrotis* spp) were controlled by the preparation of baits made up of persistent insecticides, molasses, bran and water. Mealy bugs (*Nipaecoccus aurilanatus*) were controlled by spraying soapy water onto the affected area. However, attacks were usually controlled by the mealy bug ladybird (*Cryptolaemus montrouziere*).

Hoop pine is also relatively free of major diseases (Brown and Wylie 1990). The main ones that affect seedlings are damping off (*Pithium* and *Rhizoctonia* spp), root rot (*Rhizoctonia* spp) and collar rot (*Sclerotium rolfsii*). Damping off is the most common seed bed disease in hoop pine nurseries and is caused by soil borne fungi which attack the seedlings whilst in a soft succulent condition. Under favourable conditions of high moisture and high temperature this fungi can

develop to epidemic proportions very quickly. The two types of damping off are pre-emergence and post-emergence. Pre-emergence damping off causes rotting of the seed or seedling radicle before the radicle emerges from the soil. In post-emergence the seedlings are effected after they appear above the ground. Seedlings affected by post-emergence damping off are characterised by a dark water-soaked constriction or girdling at, or just above, ground level. This weakness causes the stem to collapse. This disease was controlled by reducing the application of water or applying Cheshunt mixture (a mixture of powdered bluestone and rock ammonium carbonate). In later years Captan 80 was used as a control agent.

Root rot is the second most serious hoop pine nursery disease. It occurs sporadically and affects advanced stock. Often the young seedlings may have advanced root rot without showing any foliage symptoms. The disease was controlled by the application of Cheshunt mixture. Another method of control was by soil furnigation with chloropicrin. Collar rot was controlled by the application of cheshunt mixture either to seedling or to fallow beds. In recent years it has been controlled with quintozene.

#### Records

In 1924 Swain initiated a detailed method of keeping nursery records. Regular records including germination counts and number of seedlings on hand (in the bed, in transplant lines, in tubes and ready for dispatch) were submitted every six months to the Ranger-in-Charge of the local reserve. At some later date this system was replaced with the Nursery Return form that was submitted twice a year (usually February and June). Sowing numbers, tubing numbers, stock age, batch details and dispatch details were recorded on this form. Also, an Annual Report, detailing new work or improvements done at the nursery was submitted in June of each year.

A nursery bed register was also maintained. In this a record was made of each treatment (fertiliser, sowing details, pest and disease control measures etc.) applied to each bed along with the number of stock produced from each bed.

## Conclusion

The history recounted in this paper is one of long endeavour to find and improve ways of growing hoop pine seedlings in the nursery. Hoop pine is not an easy tree to raise, yet the ability to do so was critical to developing plantations. For 70 years a succession of techniques were developed by research officers and nursery managers of the Queensland Forest Service—later the Department of Forestry—in all aspects of nursery work. Although some techniques were adapted from those used in nurseries elsewhere, others were local innovations.

The history is also one of hard manual work. All the work done in hoop pine nurseries was very strenuous. Lifting and standing down were very demanding on

the back muscles, while tubing was demanding on the wrist muscles. Those grading and tubing were also required to stand in the one place for many hours. In nearly all nurseries there was very little job sharing. Everyone was allotted a task which they did every tubing season—year after year. Easier and more mechanised ways were developed in stages.

Gradually an effective nursery regime specifically for hoop pine was developed which was fully integrated into the overall plantation establishment practice. The thoroughness and robustness of the early research and development work set a solid basis for implementing the container method of production. This system was fully implemented in 1998 when a dedicated hoop pine production nursery was built at Beerburrum. The story of Queensland's hoop pine plantations contains the story of trial, persistence and hard work by many people in the nurseries.

## Acknowledgements

Whilst not referenced in the text, Technique for the establishment and maintenance of plantations of hoop pine (Araucaria cunninghamii) (Brisbane, Forestry Department, 1963), and the Nursery manual: a guide to operational procedures (Brisbane: Department of Primary Industries, n.d.) were consulted extensively during the preparation of this paper. Thanks are due to Mark Hunt and Paul Ryan for their editorial comments on the manuscript.

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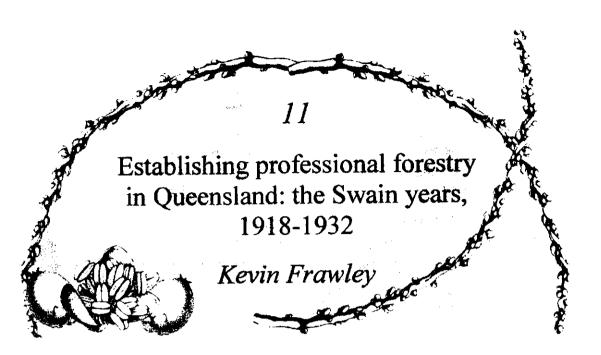
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Professional forestry became established in the Australian States in the first three decades of the twentieth century. In this period a number of leaders emerged to set a direction for the profession as best they could in the circumstances of the time. These included the First World War and its consequences for world timber trade, industrial development and land settlement policies in reconstruction, and general lack of political and community support. Just as some progress was being made in forestry, State budgets and the timber industry were affected by the Great Depression. Finally, there was the task of establishing a relationship with the industry that had operated largely unfettered in the bush. Edward Harold Fulcher Swain was one of these forestry leaders, first appointed by New South Wales in 1899, head of the Queensland Forest Service 1918-32, and New South Wales sole commissioner 1935-48. A zealous and eccentric figure who would by the 1930s be described by some other prominent foresters as 'mad' and as 'Australian forestry's enemy no.1', Swain has been realistically appraised as the 'odd man out' amongst this early group (Meyer 1985).

This paper first considers Swain's early years in New South Wales and the development of his forestry ideas, and follows with his time as head of the Queensland Forest Service. Swain made an important contribution to the struggle to establish professional forest management in Australia and scientifically based natural resource management generally. Especially in Queensland, he established directions in professional forest management that were, to a significant extent, in spite of the Government and the established bureaucracy.



Figure 1: E.H.F. Swain, 1929. Chairman of Provisonal Forestry Board Photo: Courtesy Nancy Foote

# Early years in New South Wales, 1899-1916

E.H.F. Swain was born on 6 April 1883 at Glebe, Sydney, the third child of Edward Plant and Annie Marie Swain. Swain's father had arrived in Sydney from England in 1864 and his wife (née Dodd) was the daughter of a Tasmanian shipowner and sawmiller. Swain's father was a flour merchant and shop owner,

but nine children (of which only three survived) and the 1890s depression, resulted in straightened circumstances during Swain's childhood.

The family moved around during Swain's childhood and his schooling was patchy. Enrolled at Fort Street Model School at the age of 13, Swain later commented: 'Nobody at Fort Street noticed that I had scarcely been to school at all' (Foote et al. 1971: 10). Family circumstance, however, gave him the determination to succeed and increasingly he felt the need to work to assist his family. His entry to forestry was largely by chance when a position as Cadet Forester in the Forestry Branch of the Lands Department of New South Wales was advertised and he took up his appointment on 18 June 1899.

It may have sounded 'romantic' to the 16 year old Swain but the reality was different. Forestry was of peripheral interest to the powerful Lands Department mainly concerned with settling the land and bringing in revenue. It was to be some time before he got out into the forests and the formal means did not exist for him to become educated in forestry. The frustration of this period, when in Swain's words, R. Dalrymple Hay (acting head of the Forestry Branch) 'didn't know what to do with me', undoubtedly influenced Swain's later career. This included his conflicts with public service commissioners, his frustration with public service procedures that seemed to be an end in themselves, and the slowness in recognising forestry as an applied science rather than just an agency for collecting 'timber taxes'.

Swain set about a program of self-education. He obtained the Oxford forestry syllabus, studied the subjects it contained and copied out by hand the five volumes of Schlich's forestry textbook which was the standard at the time. In 1901 he attended the University of Sydney and in 1902 the Sydney Technical College. His lack of formal forestry qualifications was to be a weak point in his later forestry career, not in regard to gaining appointments, but particularly in his conflicts with C.E. Lane Poole (Acting Principal of the Australian Forestry School from 1927). His experience of commencing his career as a junior public servant and acquiring knowledge and skills through his own efforts and field experience was probably unique among the leaders in the development of Australian professional forestry. When Swain began the Forestry cadetship system in Queensland in the 1920s, which supported foresters gaining both bachelor and masters degrees, he still made sure that a significant period was devoted to practical experience in the bush.

Meanwhile, from 1901, Swain began to see field experience, first (unsuccessfully) at Gosford nursery, but most importantly with a year at the National Herbarium in Sydney. Under J.H. Maiden, the Government Botanist, he studied the eucalypts and built up contacts which would be useful when he later began extensive surveys of the north-west of the State. From 1904 to 1910, he was given a series of country appointments, beginning with Cootamundra, and the rest on the north coast, particularly the Bellinger River area. Here, he reflected on the lack of forest management—there was no forest policy beyond 'timber taxes' and a few State Forest reservations.

These years in the bush set him thinking about the Oxford forestry syllabus and what it lacked for an 'Australian' forestry. The extra list was wide ranging including wood technology, economics and business management, climatology and ecology, forest engineering, survey and draughtsmanship, law and administration, public relations, politics, psychology, philosophy, religion and practical bushmanship. From this time on the north coast, the idealistic and spiritual aspects of Swain's character, which profoundly influence his later career and dealings with the timber industry, become evident. He commenced to write about the forests and the people who lived and worked in and near them (Swain 1907, 1909, 1911a, 1911b, 1913a). These writings express aesthetic, humanitarian and spiritual thoughts and stand out in a profession where most have been reluctant to produce more than technical reports and scientific papers and, in some instances, few of these. Swain's writings are notable also because of their ecological approach in the early days of ecological studies (though they are not systematic ecological studies as such). There were the experiences of forest survey work:

In my overloaded buggy and pair, I arrived at the last selection, snowed under by heavy frosts. I took parallel strips on which I measured sample plots. I was there for a month. Had I had an accident I would never have been found. As could easily have been the case when, on the Bellinger River flanks of the ranges, I descended into an impasse in the dark, spent the night up to my neck in Flooded gum bark litter, with great waterfalls thundering their mocking laughter at my burning thirst; and before dawn, by the light of Halley's Comet extending from horizon to horizon, ascended stark stone cliffs by my finger tips and toes, to finally plunge my face at the top into a pool of saturated leaves, and thence reattempt my egress.

The department was horrified by my final estimates—there couldn't possibly be so much timber there. And please explain why I lost my prismatic compass on Mt. Gooberygooberiam.

(Swain, n.d.)

There was the attitude of Head Office to people in the bush, including himself:

In 1910, I had been a Cadet Forester for ten years. Completely forgotten by the Head Office officialism supported by its timber taxing powers. The timber industry, like the dairying industry was battling for sustenance. I had been instructed that I must not associate with sawmillers. They were thieves and I was the forest policeman. Personally, I admired their valiance, and sympathised with their condition, and vowed that I would some day establish a co-partnership of forest industries and forestry in common cause. In a forest policy not founded on Parkinson ambitions for lucrative overlordship.

(Swain, n.d.)

And there was the simple dignity of the bush workers:

You will find him amongst the North West Ironbarks, and the South West Red Gums. The Woollybutt and the Grey Box and the Stringybark on the south coast fear him, and the old hand Blackbutts and Tallowwood and Mahoganies of the North, cancerous with age and white ants feel the creep of doom at the sharpening of his broad axe.

You will hear his lonely 'chop' 'chop' in the bush gullies or among the ridges and the pheasant knows it well. He generally works alone—with pipe and tobacco and matches on the stump handy. He is taciturn, and his lip curls when you suggest it is a lonely game. Mates quarrel—not so he and his pipe. And he gets the worth of his work—instead of dividing it with a lazy mate.

(The Sleepergetter in Swain, n.d.)

In 1911, Swain was appointed District Forester for the North-West, at Narrabri. For him, this did not mean simply supervising 'timber tax' collectors: at last I was in charge of something and I knew that as the first Australian Cadet Forester, I had to pioneer every step in the development of Australian Forestry' (Foote et al. 1971: 40). The first two steps were the initiation of 'stumpage appraisal' (rather than fixed royalties) and the undertaking of forest assessment surveys (using instruments purchased by Swain from his salary). Swain's comments can be seen simply as an example of his ego, but they can also be seen in the context of his frustration with the revenue collecting bureaucracy and its high-handed treatment of bush workers. Swain saw his appointment as an opportunity to pioneer proper forest management beginning with textbook survey and assessment. But he also saw the economics of the local cypress pine industry as an important issue, with 'seven millers strung out along the road' and the most distant being disadvantaged due to transport costs. It was here that he commenced, with sawmiller agreement and without head office approval, the stumpage appraisal system that was to become the basis for sawmill log pricing throughout Australia. He also continued to publicise the forestry cause. In 1913, he prepared a series of articles for the North West Champion at Moree (Swain 1913b). These had an ecological focus, discussed the different forest types of the region, set out the aims of forestry, and referred to the preparation of working plans for the district forests which would set out how yield would be sustained. The articles also argued the need for forest conservation:

All the world over, the principles of forestry are the same. They are founded on natural laws, need only local application. No country of the world is so independent of Nature that it can afford to ignore the necessity of forest conservation, and it is only a matter of time when even improvident Australia will learn, by her own particular experiences, to take advantage of the knowledge of forest principles so laboriously gathered through centuries in the countries of the Old World

(Swain 1913b)

Swain may have visited New Zealand in 1912 but this doesn't feature in surviving records. In 1915-16, he took long service leave—not a holiday but another chance to study forestry. A European visit would not have been possible at the time, but it appears he chose to go to the United States to take a six-month forestry course at the University of Montana. The resulting book, An Australian Study of American Forestry (1916) outlines Swain's arguments on the limitations of European forestry in establishing sound forest management in New World countries like Australia and the USA. Though he acknowledged that the general principles of forest science developed in European forestry had universal application, he considered the biological and silvicultural emphasis too limited.

In his view, the forestry professional in Australia and the United States needed a broader range of skills, especially how to manage forestry as a modern efficient business.

In the New World, there was an abundance of wood of many species whose properties were unknown, with large volumes of 'old-growth' and forests being cleared for agriculture. This contrasted with Germany which had an elaborate silviculture, built up over 400 years with even-aged forests of few species on private land in a market situation of wood deficit (Clawson and Sedjo 1984). Economics, and efficiency in forest operations, were major considerations in Swain's view. Underlying Swain's report was the influence of the ideas of the North American Progressive conservation movement, of which the head of the US Forest Service Gifford Pinchot, was a leading proponent. The aim of the movement was to bring about rational planning to promote efficient development and use of natural resources ('wise use' utilitarianism) (Hays 1959). The Progressive conservation movement reflected a developing technological age that would emphasise large scale, long term planning and technically based resource management utilising the skills of trained professionals.

Concluding his 1916 Study, Swain made recommendations for Australia, setting out the 'four cornerstones of Australian forestry development'. These were the immediate provision of a scheme of forestry training, the development of forestry science by research, the establishment of an organisation (the organisation of personnel, administration and the State Forests), and building an efficient forest management system.

It was Swain's appointment to Queensland, soon after his return from the USA, that would give him the opportunity to attempt to put these ideas into practice.

## Queensland, 1918-32

Swain's Queensland appointment was as District Forest Inspector, Gympie, in October 1916. He had expected an offer of a Commissioner's position in New South Wales under the *Forestry Act 1916* but in his words: 'R.D. Hay would have none of me. He was my mentor and I was his tormentor' (Foote et al. 1971). However, N.W. Jolly's appointment as a Commissioner in 1918, opened the door to the Queensland directorship which Swain won from 32 other applicants (*LDBF* 683).

The foundations of professional forestry in Queensland were laid in the period 1911-18 by Jolly, who was the first professionally qualified forester appointed to an Australian forest service. The legislative basis was the *State Forests and National Parks Act of 1906* which remained the legislative charter for State Forest and National Park administration in Queensland for the next 53 years—the State being the last in Australia to pass a comprehensive Forestry Act.

# The Queensland context

Swain's 1916 Study set a huge agenda. In his fourteen years as head of the Queensland Forest Service, he would firmly establish professional forest management in the State as well as involving himself in a forthright manner in national forestry issues. However, the place of forestry within governmental administration was created only with difficulty. Much to Swain's despair, by the time of his dismissal, Forestry had still not achieved comprehensive legislation. The lack of a statutory base left the service vulnerable, subject to political whim and bureaucratic power struggles. With the appointment of Queensland's first Public Service Commissioner, J.D. Story, in 1920, a running battle began between Swain and Story which was to become a key factor in Swain's dismissal.

Swain built a forest service whose staff, like him, grew into dedicated enthusiasts for the forestry cause. Forestry officers provided the main counterbalance to the pressure for land settlement, which by the 1920s, seriously threatened forest reserves in southern Queensland and most of the remaining accessible areas of rainforest in north Queensland. An enormous effort was expended in the 1920s trying to retain some of these areas in the face of proposed agricultural land opening.

Following World War I there was a renewed emphasis in Australia on national development and progress. The development thrust in Queensland was based on farming, and the timber industry potentially stood in the way of what was widely perceived to be the right of every man to go on the land and avoid the 'artifices' of the city. The Labor Party dominated Queensland politics through this period (holding office 1915-29, 1932-57) and its economic goals were agricultural development and decentralisation. Labor was sensitive to criticism from north Queensland and worked to combat it by public works expenditure and a generous allocation of portfolios.

# Forestry: the expansion of public administration

The Queensland Government's choice of Swain as Director of Forests in 1918 was a logical one. Not only did he have a rare combination of knowledge and experience for the time, Swain was also of the firm view that the Crown should gain the full value from its timber resources. On his appointment, he undertook to increase annual Forest Service earnings by £20,000 (LDBF 661).

Swain inherited a small Forest Branch in the Lands Department. This forestry function was to expand substantially during his term. He was concerned that Queensland forestry did not become like the Lands Departments—'Parkinsonian bureaucracy' as he later described it, which stifled initiative. A key task for Swain was to complete the transition by which forest administration was removed from Lands Department officials (concerned mainly with revenue collection) and placed under the control of professionally trained foresters who

would begin to undertake active forest management. However, he did not fully succeed in achieving this change in his fourteen years in Queensland.

At least he began with a sympathetic Lands Minister, J.H. Coyne, and finished the first of his detailed annual reports with a list of the 'elemental needs' of the State: the constitution of a definite and sufficient forest estate; a strong forest redemption policy; reinvestment of forest surpluses in forestry; a modernised Forestry Act; the establishment of an independent Forestry Service; strengthening of the forest staff, particularly on the technical side; and a Forest Products Laboratory. To carry out the necessary functions, Swain organised the Branch into three sections (administration, harvesting and marketing, and technical operations) and divided the State into six regions. This structure was first formalised in 1924 and remained the essential organisational structure long after his dismissal.

#### Administration

Commonwealth funding for the employment of returned soldiers after the War was of considerable assistance to Swain in making a start on the Queensland forestry agenda and by mid-1920, 239 returned soldiers were employed (Swain 1969: 8):

My first break however, was the return of soldiers from World War 1. The Commonwealth provided two year's finance for their re-employment. I collected returned soldiers who had surveying experience, deployed them in the Forest Assessment survey camps and drilled them in such surveys, including botanising for the tallying of the admixture in the natural forests. And I got a picked draftsman from the Lands Department. Over the years, before aerial surveys, these soldier parties ranged from north and south, mapping and tallying, using for contouring the Bonner Abney and Tape, which I brought from the U.S.A.

Strip assessments remained the technique used, until the era of aerial photographs after World War II (Dargavel and Moloney 1996). It was hard and tedious work, especially in north Queensland.

Following the appointment of a Public Service Commissioner, a new structure for Forestry was in place in 1921 with District Foresters at Atherton and Gympie and Deputy Foresters in control of the other four districts (Maryborough, Brisbane, Bundaberg-Rockhampton, Dalby). The advances in staffing were not matched by the status of the Service as a whole. Despite some early promise, one of Swain's greatest disappointments through the 1920s was the failure to achieve comprehensive forest legislation to replace the 1906 enabling Act. There were two main reasons for the failure to legislate, even though Swain stressed the need for comprehensive legislation to successive Lands Ministers and such legislation was supported by the British Empire Forestry Conferences of 1920 and 1928 (Swain 1920: 1046; Third British Empire Forestry Conference 1929). First, while supplies of timber met demand, and imports (at cheaper prices) were available, the question of improved forest management lacked political

immediacy. Second, the Lands Department blocked any proposed Bill which would have increased the relative strength of the Forest Service.

Successive Bills were prepared between 1920 and 1932. Failure to get a Bill into the Assembly due to Lands Department opposition was turned against Swain by the incoming Labor Lands Minister, P. Pease, in 1932. He criticised the 'expensive Forestry Board' which was 'not capable of formulating a Bill which any Minister can bring into this House' (QPD CLXI 1932: 1969-70).

Two of the main benefits of the legislation Swain envisaged would have been autonomy for Forestry and the establishment of a normal departmental structure. Between 1918 and 1932, the Service was under the control of a Provisional Forestry Board with varying membership. From the outset, Swain refused to acknowledge the authority of the Under Secretary for Lands (no doubt believing that he was of equal status). From 1920 he also had to fight to retain a separate Forestry administration against the recommendation of Public Service inspectors. Basically, Swain wanted to do things his way:

But I had become known as a non-establishment, non-conformist, and a Public Service Commissioner was now appointed by Cabinet, and he appointed a Public Service Inspector who descended upon me, arrogantly bureaucratic, forbade the office systems I had personally designed, and installed a clerk from the Lands Department to forcibly reinstate the Lands Department's formulae [sic].

(Swain 1969)

In his election policy speech in 1932, W. Forgan-Smith promised an 'up-to-date Forestry Bill' if Labor was elected (*Tableland Examiner* 4 May 1932). This was not forthcoming. The first Labor legislation to deal with forestry matters was the *Prickly-pear Land and Forestry Administration Act of 1932* under which the Provisional Forestry Board was dissolved and the Land Administration Board assumed control of forestry matters. After twelve years, the Public Service Commissioner and the Lands Department had finally achieved their goal.

## Education

Education and training and the need to formally establish an Australian Forestry School had been on the agenda of successive Interstate Forestry Conferences since 1911. The 1917 conference passed a resolution that the Commonwealth should establish a Forestry School (Report 1917). This was a matter to which Swain had given considerable thought over the years and he set out his ideas in some detail in his 1916 Study, including the view that a school of forestry be established in each State. Forestry education was a central issue for Swain—perhaps almost an obsession. He waged a lifelong campaign against what he termed 'Druidic' forestry, or 'feudal European, sans economics' teaching. To Swain, the foremost representative of this was the Acting Principal of the Australian Forestry School, C.E. Lane Poole. He continued his criticism when the 'Un-Australian School of Forestry', having moved to the Australian National

University, appointed J.D. Ovington from England as its first Professor in 1965. This followed the term of one of Swain's cadets, K.P. McGrath as Acting Principal (1959-65):

The worst influence in Australian Forestry was the English-staffed Commonwealth School of Forestry at Canberra. It taught Forestry as a medieval mysticism with Foresters as its priests. To these, profit and loss management was a vulgarity.

...the alleged Australian School has relapsed into the affectation of prior Lane-Poolism. The Australian Forestry Departments were not consulted in any way as to how their staffs should be trained. And, pusillanimously, shut their eyes and mouths.

(Foote et al. 1971)

Based on the contention that Queensland's subtropical and tropical conditions required special training, Swain considered establishing a forestry school at Imbil but did not proceed. In 1924 a forestry cadetship was launched, initially based on work in the Service and study at Queensland University. However, once the States had agreed on the establishment of an Australian Forestry School which commenced in Canberra in 1927, Swain had little choice but to send students there. The course of training for Queensland cadets included field experience in nurseries and a Forest Valuation Survey camp as well as two years at Queensland University before going to Canberra—enough time in Swain's view to counteract 'European' influences in the southern teaching.

By the late 1920s a nucleus of professionally qualified staff had been formed, some gaining outstanding academic distinctions and making major contributions to Queensland and Australian forestry in subsequent years (e.g. V. Grenning, A. Trist, A. Crane, L. Rodgers, A.J. Owens, W.F. Pohlman and M.A. Rankin). In Queensland, however, these 'forestry experts' became the subject of ridicule from politicians, the timber industry and Lands Department officials. Critics were keen to comment on how professional foresters were disposed towards 'impractical' schemes for forest reservation, regulating the cut, and reafforestation programs, all of which had to be paid for with higher royalties.

Swain's opposition to Lane Poole was based on his view that the curriculum of 'European forestry' was too limited and traditional for the requirements of a modern forestry profession in Australia. The personal enmity grew through the 1920s and 1930s. For example, there was the 'great Australian dogfight' at the 1928 Empire Forestry Conference over Lane Poole's proposals for the centralisation of forestry research in Canberra with Swain on one side and Lane Poole, N.W. Jolly and S.L. Kessell on the other. To what extent their differences may have delayed Commonwealth involvement in forestry matters is unclear. K.P. McGrath noted that Lane Poole was friendly with Prime Minister S.M. Bruce (1923-29) and made the following comment:

I remember on one occasion Lane-Poole telling me that he was frustrated with Swain. That he wanted to do something in Forestry and Swain wouldn't have it on at all and at one stage Bruce said to him, 'we, the Commonwealth don't have much opportunity to do anything in forestry, but we would like to

do something, and certainly are prepared to do something, if you blokes can make up your mind what it is we should do. Swain opposes it, and the minute Swain proposes something, you oppose it, so you can't get anywhere'.

(K.P. McGrath 1979 GT/9 A1)

There may have been an element of class division in Swain's view of Lane Poole. Lane Poole mixed with the bureaucratic and political elite in Canberra such as Bruce, who came from a privileged background in business and law and whose government strongly supported business interests.

# Harvesting and marketing

In harvesting and marketing the period after 1918 was marked by two particular features: the introduction of a 'commercialised sales policy' by the Forest Service, and the transfer of the operation of the State sawmills to Forest Service management. Swain expressed the first this way:

Meanwhile. I faced up to the melee of timber trafficking that disfigured the early timber trade of Queensland. Adopting the competitive price of Hoop Pine on the world market at Melbourne, I costed it back to Brisbane, converted it to log price and costed it back to the several Hoop Pine forests on stump, less logging costs. Grading logs as plywood, mill and case quality, in diameter classes. I determined the stumpage values for each.

(Swain 1969)

The commercialisation of timber sales policy was aimed at achieving the maximum return to the State for its timber resources and more efficient utilisation of species. The policy resulted in timber revenue collections rising substantially to reach a peak of more than £400,000 in 1926-7. Forestry surpluses paid into consolidated revenue showed a similar increase until both were affected by the Depression. Reafforestation works were funded from loan monies and from 1919-20 until the Depression averaged almost £35,000 per annum. Swain saw the financing of the plantations from loan funds as the necessary adoption of the profit and loss discipline of private enterprise' to forestry (Foote et al. 1971). However, as revenue collections rose (especially as royalties had risen substantially under stumpage appraisal), the Forest Service was criticised by millers and politicians as a rapacious authority inimical to the public good.

In 1918 the first Key Market log price lists were issued and adjusted periodically in line with market movements. In the same year arrangements were made for a radical departure from the stump sales system (where buyers arranged for cutting and haulage) to one of direct sales 'on trucks'. This began in 1919 for hoop pine and north Queensland rainforest timbers. Under the direct sales system the Forest Service arranged for cutting, loading and hauling under contract, and timber was sold by tender or auction on trucks at railway yards. The direct sale system was aimed at efficiency in timber extraction, maximising revenue and facilitation of subsequent silvicultural procedures.

Sales 'on trucks' suited established rail-side mills, and stump sales continued on remoter stands for bush mills to cut in situ. The larger rail-side mills had been

located next to private and Crown supplies, especially of hoop pine, which were being cut out by the 1920s. With stands becoming more distant, sales were increasingly made on the stump to bush mills and by 1925 this had led to acute log shortages for the established rail-side mills. This soured relations between the trade and the Forest Service—but Swain's stand was uncompromising (Swain et al. 1926: 15):

The evolution which the logging and sawmilling industry is now undergoing is a perfectly logical economic development which cannot be stayed by artifices...The essential thing is that the Queensland consumer be served with efficiency, and that ineffective organisations and dispositions be not subsidised by adoption by the department of uneconomic programmes and policies.

The onset of the Depression from 1929 brought difficulties for both the Forest Service and the industry (low demand, low prices and a glut of imports). The Government made royalty reductions from 1929 and initiated a number of inquiries into aspects of forestry. It was a time when criticism of the Forest Service and of Swain mounted. An important consequence of the Depression was that the Forest Service was left in a relatively poor position politically, especially when the timber trade problems were combined with the Service's opposition to proposed land opening in north Queensland.

State sawmills were one of the State Enterprises established by the Labor Government from 1915. Swain welcomed the acquisition of the mills which he considered to be a logical extension of forestry activities. By 1922 State sawmilling included Brisbane timber yards and planing mill, and mills at Imbil, Taromeo, Injune, Birimgan and Silkwood. Swain saw the mills as providing valuable trade data, cheaper timber, and a way of controlling monopolistic practices in the timber industry (Swain 1924a: 1122). Naturally, they were never looked on favourably by the industry that generally tried to persuade the Government to get rid of them.

While the operations showed a net profit from 1920 to 1929, each year from 1929 saw mounting losses and in 1932 the Forgan-Smith government decided to sell the remaining operations. The sale was a symbolic political move on the part of the Labor Government to remove this socialistic threat to the sawmilling industry and in Swain's words: 'So a Labour (sic) government ate its young' (Swain 1933).

# **Technical operations**

Swain considered the major goal of the Forest Service to be the continued supply of the State's demand for wood by the best use of the wide range of species with which it had been endowed. As Carron (1980a) has outlined, achieving this was a circular process. A continuous supply of wood relied upon the maintenance of forest productivity. This depended on the correct silvicultural procedures, the success of which was based on the effectiveness of utilisation, which in turn depended on a knowledge of the properties of the species, on dissemination of

information on their uses, and on the efficiency of marketing. All this was a tremendous challenge when so little was known about the forests.

In 1916, Swain had defined the aim of silviculture as the 'attainment of the normal or perfect forest'—the classic European concept. For the Queensland forests, with their large number of species, there was the need 'to sort out the multiplicity of tree species and rearrange them in ordered commercial forests capable of producing the maximum quantity of high grade wood in the minimum rotation' (Swain 1921: 960). In the 1920s, the softwoods were the most important in terms of timber demand and proportion of total sawmill cut, and the Forest Service's research efforts were soon focused towards maintaining softwood supply.

This direction was in line with national concerns about softwood self-sufficiency. This had been discussed at the Interstate Forestry Conferences since 1911, and at the 1922 conference, with the recent experience of World War I, the forest services were able to persuade the State Premiers of the need for self-sufficiency in coniferous wood (Carron 1980b). Until the early 1920s about two-thirds of the indigenous Queensland softwood supply was hoop and bunya pine cut from alienated agricultural land but this was now in decline. Imports of north American Douglas Fir ('Oregon') and Baltic pine made up the deficit.

Initially, Swain placed major reliance for Queensland's future timber needs on natural regeneration of indigenous species stating that perpetuation and improvement in the 'fine native forests' should take precedence over 'planting out potted plants by the million'. For the softwoods, he saw in Queensland a 'rout of the exotics', in particular the 'gross and gawky' radiata pine, and envisaged hoop pine as the main constituent of Queensland's softwood self-sufficiency program. From a silvicultural viewpoint, however, the difficulty with the maiden pine forests was their 'old growth' nature, two thirds of trees being in large girth classes exceeding 150 centimetres at breast height. (Swain et al. 1926: 268). Once these were removed, land settlement interests described the forests as 'cut out' and therefore not justified as forest reserves.

It fairly soon became evident that natural regeneration would not be sufficient to supply future needs. Swain's comments on the matter were prophetic and expressed ecological concerns:

Thus comes to an end the original gift of Nature to man in wood. In sixty years from today the work of two thousand years of forest demolition by the human race will have been rendered complete ... This to me appears to be one of the most momentous economic facts of modern times. Hereafter, man must rely upon his own endeavour to supply him with the timber he needs...

The age is one of grim utilitarianism. The barbaric charm of unordered Nature appeals not to our civilisation, and the fantastic variety of the Queensland wildwood must yield to the prim monotony of the regularly spaced and densely grown plantation forest, which amasses a maximum production of serviceable wood in a minimum period of time. Nature, however, may demand its revenge. In the natural forest associations there is a biotic equilibrium which may be lacking in the artificial forests of man's creation...

Even the forester must be respectful to Nature and a proper ecological arrangement must be maintained, by suitable intermixture of species and age classes, and a balanced composition of the whole forest.

(Swain 1925)

The Forest Service began a softwood plantation program aimed at about 5000 hectares a year for which it sought government support throughout the rest of the 1920s. By rationing the cut, finding substitutes, and temporarily increasing imports, it was hoped to ease the decline in the native timber resources until the plantation products could make up the anticipated shortfall. Research work for the softwood program was directed from 1924 by V. Grenning (Oxford trained and Queensland Rhodes Scholar 1919) and in the same year Swain published early observations on the silviculture of eucalypts and hoop pine (Swain 1924b, 1924c).

Initial softwood plantation establishment was based on hoop and kauri pine. However, there was a shortage of former rainforest sites close to Brisbane (the most suitable for hoop pine), establishment and maintenance costs were high, and hoop pine is relatively slow growing. This led to consideration of alternative faster growing species suitable for the poor quality coastal lowland soils north of Brisbane. These 'wallum' areas were not sought after for agriculture and were generally viewed as wasteland.

Plantings with *Pinus* spp. began in 1924 with species being chosen on the basis of Swain's homoclimatological studies (Carron 1980a). By the late 1920s, the planting program was based on hoop pine in selected sites, and exotic slash pine (*P. elliottii*) and loblolly pine (*P. taeda*) on the poorer coastal sites. Experiments continued with other species including Caribbean pine (*P. caribbaea*). Plantation establishment was given a boost by the Unemployment Relief Scheme during the Depression, and by 1932 almost 3320 hectares were established. These were mainly softwoods, though there were small eucalypt and cabinetwood plantings in the Brisbane Valley, Fraser Island and Atherton districts. Natural regeneration treatment had been applied to 32,390 hectares by 1932.

In north Queensland, silvicultural activities remained largely experimental, as utilisation in the 1920s was mainly the cutting of prime species from private land prior to clearing. Regeneration and succession in rainforest received attention in the booklet prepared by Swain for the 1928 British Empire Forestry Conference in Australia. Drawing on specialist sources, the 70-page booklet is an evocative, geographical and ecological description of the forest conditions of Queensland. It includes an ecological classification of Queensland forests prepared with the assistance of Swain's climate classification studies and concludes with a stimulating discussion of regeneration and succession (Swain 1928a):

There is this to be recorded, that the plant associations appear to register definitely the degree to which the site conserves, under the Queensland climate, the moisture of its air and soil...Right through the ecological story of Queensland runs this theme of shelter, against wind and against excessive illumination and their concomitants...The sylvan succession in Queensland appears to proceed generally speaking from exposure resisters to shelter

seekers. The economically desirable species develop around the centre of the cycle. Natural regeneration processes for these species may thus become a reversion rather than a stimulation of the succession...

Except perhaps in the case of the Eucalypts, natural regeneration processes must seemingly yield in Queensland to clear felling and planting afresh. Nature has not been a success in commercial reforestation. In the artificial operation the chief considerations appear to be shelter, appropriate soil conditions, wider spacing, and weed eradication. Silviculture in Queensland appears destined to become more agricultural.

If silvicultural work was to proceed and natural forests brought under sustained yield, it was essential that there be secure reservation of an adequate area of forested land. The 1920 Interstate Forestry Conference in Hobart endorsed a national goal of 9.9 million hectares of forest reservation of which Queensland's share was 2.43 million hectares. Despite various political promises, this figure was not achieved in Swain's term, as 61 per cent of the 2.25 million hectares set aside in 1932 was insecure Timber Reserve. The reservation problem involved acquiring sufficient land of suitable quality. There was a widely held view that forestry was a residual land use which should be confined to the more remote, agriculturally unsuitable and 'inaccessible land'. Even when politicians supported reafforestation, they preferred it to be elsewhere, as V. Grenning remarked: '... they'd admit that reafforestation was a good thing "as long as it was at least a hundred miles away from my place"...' (V. Grenning 1979/GT10, A1).

The establishment of forest products research was to be a major legacy of Swain's period in Queensland. This work was in line with developments in the other States, but in Queensland was less tied to industrialisation objectives. Research in Queensland was focused on utilising more species, widening the use of particular species, conserving prime species by restricting their use to high quality end products, and replacing imports with treated secondary timbers. Swain established a Wood Technology Branch and by 1923, a Universal wood Index had been completed, classifying Queensland's commercial timbers and comparing their properties with imported woods. By 1926 the Index contained 250 species.

Swain initiated the work, but most of it was carried out by C.J.J. Watson. It culminated in the publication of *The Timbers and Forest Products of Queensland* (Swain 1928b; Carron 1980a). It was an outstanding effort for such a short period of research and received wide acclaim. After Swain's dismissal, the work was continued and expanded.

## North Queensland land settlement

During the 1920s, there was considerable pressure for large-scale land opening in north Queensland, mainly for dairying. Swain took a particular interest in the north, criticising proposals for more land opening when much previously opened land was undeveloped, and land supposedly held by eager farmers was in the

hands of timber interests. His criticisms of 'hill-billy' settlement and the Lands Department which seemed to give land, and the forest that went with it to anyone, were strident. He continued his message into later decades:

The Lands Administration of the day disclosed itself as merely a wholesale land opening agency, having no perception of the developmental importance of natural resources, no appreciation of conservation principles, no idea of land economics or of land utilisation, no policy at all except to parcel out the country into individual blocks regardless of consequences or of topography, and to tab each with an owner's name, regardless of his qualifications or of his bona fides.

(Swain 1931. Referring to the opening of the Atherton Tableland)

In a century of colonial exploitation, we have prostituted these reservoirs of agricultural waterings, superseded their timber production by timber importation, and used them to dispose of our unemployment nuisance in hill-billy settlements, subsisting on the bones of destroyed forests to raise a poor-white posterity, or a new unemployment problem.

(Swain 1943)

In south-east Queensland much of the clamour for land opening involved excisions from forest reservations, but northern proposals were on a scale which reflected the relatively large areas of uncommitted land. Massive openings were proposed from Cooktown to Eungella (inland from Mackay) without any assessment of land capability, markets for proposed production, or general economic prospects. These were now generally in more rugged areas, about which quite extraordinary claims were made, and fortunately some of the large proposed openings such as the Palmerston and Culpa never eventuated.

In 1929 the Palmerston and nearby Maalan lands (near Innisfail) became part of the 'Three Million Pound Scheme' submitted to the Federal Development and Migration Commission by local councils. This proposed the development of 145,285 hectares into 1845 farms at a cost of three million pounds. Swain argued for the retention of 'cabinetwood forest' and forest for catchment protection in consideration of this proposal. The Culpa proposal was for lands south of the Tully River gorge on the Cardwell Range. Here, Swain and R.W. Lahey (a sawmiller and founder of the National Parks Association of Queensland) developed a scheme to thwart land-opening proposals when timber removal and a high standard road were proposed. The scheme involved plywood and veneer milling and a small amount of dairying to provide casein for glueing. Jules Tardent was sent to run an urgent strip survey through the area (Tardent 1978).

# The 1931 Royal Commission on the development of North Oueensland

The land use conflict in north Queensland soured the already poor relations between the Forest Service and the Lands Department. To the latter there was no question that land opening should not proceed, in line with the central direction of government policy. But Swain would not alter his view that all vacant Crown

lands in the north containing marketable timber should now be placed in State Forest and National Park. The differences were a constant source of frustration to the Public Service Commissioner, J.D. Story, who considered planned northern development with coordination between departments to be essential to Queensland prosperity.

Swain saw it this way:

...the Public Service Commissioner recommended a Royal Commission on the development of north Queensland, and nominated William Labatt Payne as Chairman—adding a surveyor and a butcher.

The central theme of the Royal Commission was to throw open the great cabinetwood forests of the north to the timber trafficking, which had been profitable and popular in the past—vide the scandalous files of the Lands Department passed to me by its officers in friendly support of my opposition. Its purpose was to win the three northern seats at the forthcoming election.

(Swain 1969)

The Commission's direction was clear from the first press release describing it as an inquiry into 'Forestry administration' (LDBF 1027) in which the 'Forestry Department came before them [the Commission] on the same plane as the public'. On this point, it was true to its word with the hearsay evidence of settlers and 'boosters' in north Queensland being given the same weight as professional forestry staff. In an attempt to redress the balance and put the Forestry case, the Forest Service prepared a major submission for the Brisbane sittings. The rapid production of this comprehensive 133-page document (Swain 1931) demonstrated the support Swain received from his staff.

The Commission's report, released in October 1931, recommended a number of land openings, investigation of potential future settlement areas, and new forest reservations of 111,290 hectares (though the Service estimated that 82,150 hectares of this was inaccessible mountains and gorges). More than half the report was vituperative criticism of the Forest Service. Forest officers had an 'ill-balanced enthusiasm' for their cause and their 'propaganda' was 'continuous and aggressive'. Forestry had 'strangled land settlement on the plea of providing timber supplies for future generations'. Curiously, the Commissioners found the administration to be 'imbued with old-world or foreign doctrines and practices'. 'A spirit of enthusiasm for Forestry permeates the State Forests Administration', it noted, 'ill-directed, reckless, and unfettered, it is becoming a real danger'.

The influence of the Public Service Commissioner was evident in the report. As well as the recommendations for north Queensland land use, specific attention was given to forestry administration:

The first step to be taken is, we think, to reorganise the Head Forestry Office in Brisbane. Since 1925 the staff of the Forestry Department have been exempt from the Public Service Acts and consequently have been outside the jurisdiction of the Public Service Commissioner, who, we understand, prior to 1925, had advised Governments from time to time of numerous imperfections in the internal arrangements of Forestry administration.

(Report 1931: 48)

Controversy over the Commission's report and the alternative forestry report left the Government undecided on how to proceed. The Premier, A.E. Moore's. suggestion that Swain be charged with perjury for supplying false information under oath, was countered by a report from the Auditor-General which cleared Swain of any such charge (Provisional Forestry Board 1931: 87-99). A decision on the Commission's recommendations could not be left for long, however, for the north was a major focus of the 1932 elections. The period leading up to the election was one of frenzied parish pump priming in the north, the government now stating that the recommendations had been accepted and roads into proposed settlement areas were being planned. W. Forgan Smith, the Labor leader, also proposed a 'vigorous land settlement policy'. After its election, Labor promised a 'speedy opening' of 50,586 hectares including a large block on the Culpa. However, there was now the first recognition that there had to be a more planned method of land opening involving sealed road building. Forestry marketing of primary timbers, development conditions to avoid speculation, and provision of access to Forest reservations. This delayed the proposed openings.

#### Swain's dismissal

Swain was dismissed under the Prickly-pear Land and Forestry Administration Act 1932, under which the Forestry Board was abolished and replaced by a Subdepartment of Forestry within the multi-function Land Administration Board. No explicit reasons were ever given for his dismissal but they were clear enough. There could be no resolution to the open conflict between Forestry and Lands over land use in north Queensland while he remained in office. He would never have accepted Story's new 'coordinated' arrangements with Forestry back in the Lands Department as part of the Land Administration Board. Swain was also unpopular with many in the industry who criticised the high royalties paid under stumpage appraisal. Swain's dismissal brought an outcry in the press. The Queenslander (1 September 1932) described the changes as a retrograde step, and the Daily Mail (3 October 1932) referred to the menace of 'political patronage', 'political favouritism' and 'political vendettas' casting a 'blight over the public service'. For Swain there was consolation in the numerous messages of sympathy and support received from forestry staff and others. After unsuccessfully trying to gain major compensation, he sought employment elsewhere, going on to consultancy work in South Australia before being appointed New South Wales' Commissioner for Forests in 1935.

## Conclusion

Despite the events of 1931-32, the changes in Queensland forest management instigated in the previous years were momentous and long standing. Professional forestry was established and the new administrative arrangements could not alter this. While Swain had suffered personal defeat and comprehensive forestry

legislation was still a long way off, the Forest Service had both an established professional staff and functions which would continue to develop.

At the heart of the land use conflict in north Queensland lay the adherence of Queensland governments to the agrarian goal and the unwillingness to accept forestry as an essential, rather than a residual land use. The active campaign by Swain and the Forest Service to improve forest management and achieve forest conservation fundamentally challenged the prevailing political ideology that fully endorsed unrestricted resource development. Swain argued for an 'economic-scientific' ordering of State development policy, which in land administration would avoid land alienation to 'no good purpose'. Swain's views were in line with the 'wise use' philosophy which came to underpin professionally based resource management generally in the twentieth century. Swain, like other foresters, was critical of the lack of professional training for Lands Department staff and did not accept or respect the continuing influence or control of Lands Departments over forestry matters.

In the absence of popular and political support, Swain zealously advocated the forestry cause and built around him equally dedicated staff. As A.H. Crane, one of the first Queensland cadets and Tasmanian Chief Commissioner for 24 years described, the Swain administration was 'characterised by an intense striving for adequacy in conservation, reforestation and utilisation' (Crane 1946). In newspaper articles, speeches, publications and detailed annual reports, he outlined the basis of sound forest management with its integration of harvesting, silviculture, utilisation and marketing. In general, Swain obtained the support of Lands Ministers, though he stretched the tolerance of both the politicians and heads of other government departments to the limit, as V. Grenning recalled:

he was an idealist—his one aim and object was the furtherance of forestry. And he'd fight the world to achieve his objective. He made all the heads of various departments as mad as hell with him, because they'd have arguments, and he'd always win them, and that used to make them mad.

(Grenning 1979 GT/10, B2)

Mr Swain came to us before 1920. It was not long before he gained the fullest regard and even the affection of the whole of his staff. As you know from your experience in ESTIS [Eastern States Timber Industry Stabilisation Conference], he founded the Queensland Forest Service. He did so against much opposition. He had imagination and was able to inspire enthusiasm in every officer, so much so that he could get you working most enthusiastically on something you disagreed with. There are not many people who can do that. He fought every department in Queensland in the interests of forestry... He fought the Public Service Commissioner in an endeavour to get staff and improve conditions. He was so bent on the ideals of forestry and so determined to realise them, that he finally came to the end that most martyrs do.

(Grenning at ESTIS 1948)

Swain described it his way:

The difficulties of the Forestry Administration throughout this fifteen years' struggle for forest policy and for statutory authority to manage the Crown

Forest Estate according to recognised principles of forestry are those of a specialised service endeavouring to function as such whilst awaiting promised statutory protection and powers and whilst exposed by statutory weaknesses to the constant attacks of entrenched and rival officialdom. Throughout the period, the energy of the Forestry Administration and its conviction that it was defending the public interest secured for it against officialdom the support, if sometimes belated, of the reigning Government and Ministers, all of whom in the long run saw fair play, and all of whom promised tardy justice to forestry only to pass off the political stage before justice was done.

(Swain 1932)

Swain's departure ended an era in Queensland forestry and he went on to pursue similar battles in New South Wales from 1935. In Queensland Vic Grenning consolidated the gains made in the Swain period, but with much less confrontation, as the government brought the Forest Service into a much greater facilitating role for the timber industry.

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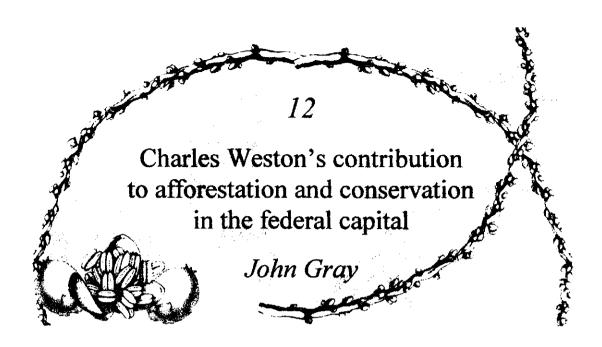
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The country owes so much to you for demonstrating what can be done in tree planting under adverse climatic conditions and Mr Rodger [first Chief Forester, Federal Capital Territory] is very fortunate indeed to have so firm a foundation to build on.

(Charles Lane Poole to Charles Weston, 12 March 1926)

## Introduction

The planning of the Federal Capital Territory (now the Australian Capital Territory) over the past eighty-eight years has been greatly influenced by policies for afforestation, conservation, landscape development and its protection. The 2,356 square kilometre Territory, which was previously a part of New South Wales, comprises undulating plains at the lower altitudes where the capital has been built and rugged mountains at higher altitudes from which the city gets its water. The reasons for this type of influence on planning are numerous but there are some more significant ones. First, the plains had been greatly degraded since European settlement by over-grazing, destruction of hillside vegetation and rabbits. Second, the need for landscape development and protection in and near cities was becoming increasingly recognised when the city was founded. Third, afforestation and conservation were given a high priority from the inception of the Territory in 1911, Fourth, the Federal Government had great flexibility in its use of land because of its unique leasehold land tenure system. Environmental policies were thus more easily pursued. Finally, and perhaps most importantly, an experienced horticulturist by the name of T.C.G. (Charles) Weston (1866-1935) pioneered afforestation and conservation in the first fifteen years of the Territory.

My intention here is to concentrate on the work of Charles Weston. His highly successful activity in the pioneering period was perhaps the most important factor in the Government's continuing commitment to afforestation, conservation and landscape architecture in the Territory. His work influenced greatly the manner in which Canberra as a 'city in a landscape' evolved.

Notwithstanding Weston's contribution to afforestation, conservation and land-scape architecture in Australia this century, documentation of his achievements at Canberra is limited. He remains a little known person in Australian forest history. Weston himself did not favour publicity and he published nothing about his work. His personal diaries were destroyed about ten years after his death. However the accidental discovery of Weston's official files in a shed in 1950 by the late Greg Murphy was a valuable step forward in filling this gap in history. They cover the period 1911 to 1926. Murphy, a local historian, published four articles summarising these files which are now held in the National Archives of Australia. While limited on analysis, these articles revealed Weston's achievements and the difficulties he faced in the period.

In this paper I intend to set down the background to Weston's long term influence over the course of afforestation, conservation and landscape architecture in the Federal Capital Territory. First, I will examine briefly his career background and draw attention to some of the ideas and influences he brought to Canberra. Second, I will summarise and analyse his pioneering innovatory large scale work at the federal capital site in the period 1911 to 1926. Finally, I will draw attention briefly to what has happened since as a result of his work.

My analysis is based on a range of primary and secondary sources. My principal primary sources are the Murphy files and other files and papers I have located

# Weston's preparation for the Canberra task

## England, Scotland and New South Wales

Charles Weston was a well trained British horticulturist who came to Australia when twenty-nine years old. His training had commenced at age thirteen years at Poyle, thirty kilometres west of the City of London. Ten years later he transferred to Drumlanrig Castle, Scotland. Weston's seven years there in his twenties was a very significant phase in his life. It was at this massive country estate that he was exposed to horticulture and forestry on a grand scale. He became an accomplished plant propagator<sup>2</sup> and his perspectives on the potential role of horticulture in improved land use were broadened. He worked there under David Thomson, one of Britain's most respected horticulturists, and who was to make a lasting impression on Weston. It was here Weston took his decision to emigrate to Australia.

When Weston arrived in the New South Wales colony in 1896<sup>3</sup> pressure was increasing for government to provide greater protection of trees in the rural land-scape and to plant new forests. Beyond the boundaries of initial settlement, the landscape had been progressively altered through removal and ringbarking of native trees and shrubs on land opened up for rural production. A key player in

responding to these concerns was J. Ednie-Brown (1850-1899), a Scottish born horticulturist. Over some twenty-one years, he was head of three colonial forest services: South Australia (1878 to 1890); New South Wales (1890 to 1895); and Western Australia (1895 to 1899).<sup>4</sup>

Ednie-Brown played a significant role in New South Wales. In 1891 as the colony's first Director-General of Forests, he called for protection of existing indigenous forest resources through forestry legislation, for afforestation through plantations of exotic species, and for the establishment of a school of forestry. Under him trial plantations of exotic and indigenous tree species were established at Wyong and Dorrigo, while a nursery and arboretum were operated at Gosford. In addition, under the guidance of his Consulting Botanist Joseph Maiden (1859-1925), an herbarium was being established and attempts were being made to publish a Forest Flora of New South Wales.<sup>5</sup>

### Joseph Maiden's influence

Weston spent his first seventeen years in Australia in Sydney. For most of this time he worked directly under Joseph Maiden, who from 1896 to 1924 was Director, Sydney Botanic Gardens. Weston was head gardener at Admiralty House (1898-1908) and Federal Government House, Sydney (1908-1912). This latter appointment marked his first involvement with the Federal Government and while there his advice was sought at the federal capital site. On 26 April 1911, he visited Acton, in the Federal Capital Territory for the first time to fix a site for 'an experimenting and testing nursery'. During 1912 he visited several times and established the nursery. This work led eventually to a full-time appointment at the federal capital site. However for a short period (1912-1913) prior to that he was Superintendent, State Nursery, Campbelltown.

Weston's employment in Sydney under Joseph Maiden was excellent preparation for the Canberra task. The Sydney Botanic Gardens were at that time in the forefront of thinking on contemporary issues surrounding botany, horticulture, public parks, forests and conservation. Maiden promoted his views on these matters outside the Gardens. In his address as President of the Royal Society of New South Wales in 1897, for example, he pressed for high quality arboreta in various districts of the colony, and for higher standards of forestry education. Between 1904 and 1909 he wrote a series of publications under the title Forestry: Some Practical Notes on Forestry suitable for New South Wales which covered various aspects of trees and tree planting. Between 1913 and 1921 he lectured on forestry at the University of Sydney.9 Other publications by Maiden included The useful native plants of Australia (1887), Wattles and wattle barks (1890), 10 the Critical Revision of the Genus Eucalyptus and the Forest Flora of New South Wales. It is difficult to see how Weston, with his capacity for innovation and new ideas, would not have been influenced by the example Maiden set. Whereas Weston owed much to David Thomson of Drumlanrig Castle, Scotland for the maturation of his basic horticultural education and skills, it was Maiden who would have won Weston's mature-age respect.



Figure 1: A typical depiction of Charles Weston with leather leggings, plan underarm and record book in hand laying out a planting.

Photo: Weston Family Collection

It is reasonable to assume that if Weston had not worked under Maiden in his thirties, he may not have fully appreciated nor understood the nature and extent of the challenge which the federal capital site presented. It is also notable that the professional relationship between the two men was to continue long after Weston had left Sydney and gone to the federal capital site. Inevitably Weston's work there reflects the influence of Maiden.

### Need for afforestation and conservation at the site

The requirement in the Australian constitution for a federal territory in New South Wales served as a catalyst for some discussion on afforestation and conservation issues there. At the Congress of Architects, Engineers, Surveyors and others interested in the Building of the Federal Capital of Australia held from 6 to 17 May 1901 in Melbourne, horticulturist Charles Bogue Luffman called for 'preservation of natural, and creation of new forests and woodlands' at the future site'. \(^{11}\) More substantial comments were provided by Joseph Maiden in September that year at a meeting of the Royal Society of New South Wales. He emphasised the importance of managing the federal territory as a whole rather than giving attention to the city site only. \(^{12}\) He also referred to the need for an arboretum there in the following terms:

We have no grand Arboretum in Australia, and the foundation of the Federal City gives us the opportunity of establishing one that should be fully availed of. This would be of ornamental appearance and of great interest to the average citizen; it would also be of high value from an educational point of view. The growth of timber trees here would be a matter of deep interest to the Forests Departments of the different States, which would probably join to partly or entirely support it.<sup>13</sup>

The urgent necessity for afforestation and conservation work at the selected federal capital site became very evident in 1909. Griffith Taylor, in a report to the government, drew attention to the serious deficiencies in the condition of the territory's landscape as follows:

One of the most urgent matters in connexion with the [federal capital] territory is that of forest preservation. The suicidal cutting and clearing of every inch of timber is appalling...After the trees have been cut down the roots decay, and there is nothing to prevent the loose soil washing down into the gullies...The question of planting the Capital Site is under consideration, but the destruction of native timber should be stopped immediately on all high stony grounds unsuitable for pasture; and of these there are many in the territory. For the timbered ridges control the climate of the whole area to a marked degree.<sup>14</sup>

# Foundations laid for afforestation and conservation

Given the above background Federal Cabinet, on the advice of King O''Malley, Minister for Home Affairs, decided in December 1910, to act. In particular it decided to 'establish a nursery for the propagation of trees and shrubs' at Acton, as an initial step. <sup>15</sup> A commitment to afforestation and conservation had been made.

#### Conditions for afforestation and conservation

The site for the federal capital was located in the ridge and plain part of the Territory. The ridges reach up to 793 metres in elevation while the plains are at

about 549 metres. Before European settlement in the 1820s, the larger ridges were covered by dry sclerophyll forest down to 700 metres while the plains were characterised by savannah woodlands and treeless grassland. Settlement altered these vegetation communities and the destruction of tree cover had a devastating effect. The predominantly shallow soils were degraded considerably by this tree removal, by grazing practices, and rabbits. Water and wind erosion occurred. Rabbits had reached plague proportions on frequent occasions and by the turn of the century netted fences were in use.

The climate of the area has a major influence on vegetation and thus on planting and regeneration programs. Cool and cold winters and hot, relatively dry summers are experienced. Frosts, which average 100 per annum, can cause severe damage to new tree and shrub plantings. Rainfall varies considerably from year to year. The annual rainfall can be as low as 300 millimetres and as high as 1,000 millimetres. There can be three month periods in summer without rain. Excessively wet years can result in water-logging and death of planted trees and shrubs. The predominant westerly and north-westerly winds in the cold winter and dry summer can devastate tree plantings. Many tree species cannot adapt to these conditions, particularly where there is little existing vegetation providing protection.

In summary the federal capital site presents great variability in conditions which were to prove a challenge for Weston.

### Acton 'experimental and testing' nursery

Little progress was made on the establishment of the Acton nursery in 1911. As mentioned previously Weston, then at Federal Government House Sydney, had sited it that year. He visited again in February, April, August and September 1912 at the request of Charles Scrivener, then Officer-in-Charge of the Territory. He ordered plants from nurseries, and provided written advice and supervision from Sydney throughout the year. By October 1912 all planting for the year was complete.

It is clear Charles Weston wanted the nursery developed as an 'experimental and testing' one. Cabinet had intended it as a production nursery. During his visit in February 1912 he prepared a report for Scrivener in which he emphasised the importance not only of plant production but also of experimentation and testing. In a later letter he stated he saw the nursery's primary objective as collecting together 'numerous varieties of trees, shrubs and plants, with a view to testing them as to their suitability etc. for the district'. Toseph Maiden, who was offering similar advice, commented to Scrivener:

If I were you I should experiment freely, because it is very often impossible to say dogmatically whether a plant will not succeed in a certain locality. You have a unique opportunity of keeping a record of successes and failures from the start. If a plant fails in any particular season, it does not necessarily follow that it would not succeed in another. If your records are properly kept they will be valuable to many people. 18

A significant event occurred at this time when J.C. Brackenreg was appointed as a lands inspector. Brackenreg had an intimate knowledge of the administration of legislation dealing with the destruction of rabbits and the erection of rabbit-proof fencing. The control of rabbits was a key factor in Weston's successful establishment of planted and regenerated vegetation in the territory.

### **Objectives**

Weston arrived at Acton on 5 May 1913 to take up his permanent appointment as Officer-in-Charge, Afforestation Branch. There was much uncertainty about the federal capital. Ahead were many changes in the political and administrative environment within which he would have to work. There were for example six Ministers for Home Affairs (and Territories) in the seven year period from 1913 to 1920.

The Surveyor, Charles Scrivener, who selected the federal capital site, saw Weston's role as establishing and operating a nursery and preparing and planting afforestation areas, predominantly on the surrounding hills. This was to achieve wind protection and soil retention. He nominated as the first areas the slopes of Mt Stromlo, the 'Shale ridge' (in Westridge), and 'elevated points on both sides of the Molonglo [River] eastward of Shale ridge with a view to reducing the force of the westerly gales'. These objectives were further refined by Weston on his arrival, namely: to establish a first class Forest and General Nursery; to raise a large stock of all subjects likely to prove suitable for all purposes; and to reserve at an early date mountains and hills—such as Black Mountain, Mt. Ainslie, Stromlo etc.—with a view to allowing natural reafforestation and testing in these areas of a variety of trees and methods of planting. <sup>21</sup>

Weston moved quickly to establish his branch. He purchased tools and equipment, established a basic reference library, and created a network of contacts for plant material sources on an exchange basis, locally, in Australia generally, and overseas. The number of workers was increasing progressively and by 1917 he was responsible for some twenty-eight employees.<sup>22</sup>

# Yarralumla Nursery and Westbourne Woods

The siting and design of what came to be known as Yarralumla Nursery and Westbourne Woods Arboretum demonstrates Weston's professional maturity at that time. His innate landscape and horticultural skills, his experience and training in Britain and Australia, and his understanding of what was needed at this critical stage of the capital's development all contributed to his ability to make these decisions speedily and decisively. Commencing on 7 May 1913, he inspected three potential sites and found the Westridge site in 'Sheedy's Paddock' suitable.<sup>23</sup> Before the month was out its from lease was proceeding.<sup>24</sup>

On 10 June 1913, he finalised his design for the nursery and arboretum. There were two basic elements: a nursery/experimental area on comparatively level ground, and a demonstration arboretum on an adjacent undulating site to the south on Shale ridge.<sup>25</sup> It is reasonable to conclude that the visit he made to Gosford in late May 1913, had some influence over his final detailed proposals.

Here he inspected the twenty year old forest nursery and major arboretum established by J. Ednie-Brown to test Australian native and exotic trees.<sup>26</sup>

He designated the forty hectare nursery/experimental area, as Division A. It consisted of a twenty hectare open nursery for holding young trees prior to planting and a twenty hectare sheltered area for propagation and testing of 'subjects likely to prove of value from an afforestation, ornamental and usefull [sic] standpoint.'

His proposal for the remaining 120 hectare demonstration arboretum, later called Westbourne Woods, revealed some of the early landscape ideas and philosophies Weston wanted to bring to the capital. He divided it into three areas. The first, Division B, was devoted to Australian trees. The second area, Division C, he allocated exclusively to exotic trees, pointing out at the same time that some, which are:

the loveliest trees on Earth ... create the glorious Spring and Autumn effects for which the cool temperate countries of the world are justly noted, and I predict that the chief ornamental charms of the future Federal City's surroundings will lie in these same Spring and Autumn features.

The final area, Division D, he envisaged as a collection of conifers.<sup>27</sup>

Development moved comparatively quickly. The final version of Weston's report was endorsed in June 1914.<sup>28</sup> Preparation of planting holes with the assistance of explosives commenced in the arboretum on 13 July 1914 and on 1 September 1914 the first trees—a batch of stone pines—were planted.<sup>29</sup> By 1920 some 44,900 trees had been planted.<sup>30</sup> Further expansion was to take place in later years and in 1983, Rout and Eldridge described the area as containing 'one of the largest and oldest collections of tree species outside traditional Botanic Gardens in Australia'. In that year some '30 species of pines, 26 other exotic conifers, 63 exotic hardwoods, 51 eucalypts and 10 other Australian trees' were reported to be growing there.<sup>31</sup>

Yarralumla Nursery and Westbourne Woods played a key role in Weston's planting activities throughout his time in Canberra. Both remain in existence to the present time.

# Experimental work

Weston was strongly committed to disciplined experimentation to underpin vegetation establishment and management in Canberra. This commitment to thoroughness was a product of over thirty years of diverse horticultural experience in Britain and Australia. It was also a reflection of his desire to move into uncharted waters in landscape terms and create a new capital which was distinctly Australian but different to the existing state capital cities. He maintained continuous contact about his experimentation with others but particularly with Joseph Maiden.

His experimental activities were centred predominantly at Acton and Yarralumla nurseries and Westbourne Woods. They were directed principally at achieving an assessment of the suitability of a wide range of exotic and indigenous species to the site, the best methods of establishment of both the exotic and indigenous components of the landscape in the many different growing situations, including broadcast seed sowing, natural regeneration and planting with nursery stock, and an understanding of the indigenous flora of the Federal Capital Territory and its potential for cultivation. He kept detailed records.

### Rural landscape conservation

Weston pursued vigorously the conservation of the federal territory's rural landscape. He attempted to demonstrate to rural lessees that the indigenous vegetation of the federal territory was an important asset which needed to be carefully preserved, protected and enhanced. In February 1914 for example, he reported to the Administrator on the cutting by lessees of willows and pines (the latter presumably *Casuarina* sp.). He emphasised the role of these trees for river bank protection and stock feed during drought and recommended that holders of land be permitted to cut or pollard vegetation only under supervision from his Afforestation Branch.<sup>32</sup> He expressed concern at times about the practices being followed. On a 189 hectare block on Mt Majura for example he noted:

that a widespread and most wanton destruction of the Mountain Oaks has been perpetrated...during the past Autumn and Winter. The holocaust of destruction that has taken place deserves the severest condemnation, and those responsible for same should most certainly be called upon for an explanation of their conduct.<sup>33</sup>

Weston persisted with this conservation viewpoint and moved to establish a set of conditions to achieve tighter control over lopping of vegetation for fodder. His firm views were, almost certainly, not well received by all sections of his Department or the lessees concerned. Eventually he was successful with the issue of circulars containing prescriptions for vegetation protection.<sup>34</sup>

He was also concerned about ring-barking. A 1915 report shows he had started to inspect, as time permitted, 'all holdings throughout the Territory' with a view to 'prevention of further wholesale ringbarking'. By August 1915 he had developed a set of conditions to ensure this. Between 1915 and 1917 he made at least 168 inspections and in many cases refused applications for ringbarking. Between 1915 and 1917 he made at least 168 inspections and in many cases refused applications for ringbarking.

Wisely Weston did not limit his contact with the rural community to these regulatory activities. He took steps to extend cooperation in other ways. In 1915 for example a circular was issued indicating the availability, at no cost, of trees from his two nurseries for ornamental, shelter and fodder purposes.<sup>37</sup> Some 3640 trees were issued to rural lessees in 1915.<sup>38</sup> While Weston regarded the initial response with some disappointment, it was the beginning of a practice which was to prove successful in the long term.

# Arguments about strategies and policies for afforestation

Despite Weston's definition of his objectives there was continuing indecision within the Federal Government on proceeding with afforestation. The principal factors contributing to this uncertain situation appeared to be the economic problems arising from World War I, the continuing debate over the Walter Burley

Griffin plan for Canberra and its execution, and the continuing weak political support for forestry generally in Australia. Despite pressure by Weston he experienced departmental inaction on the setting aside of afforestation reserves on the hills. His initial achievement came in the winter of 1915 when the first planting proceeded on Mt Stromlo. It was to prove to be his most successful afforestation project.

# Walter Burley Griffin's intervention in afforestation

The situation was further complicated by the intervention of Walter Burley Griffin who was intent on pursuing afforestation in a different way. In 1916, at the Royal Commission on Federal Capital Administration, he raised the need for cork oak forests on a large scale.<sup>39</sup> He wanted also to pursue the planting of a redwood forest on the foreshore of his proposed East Lake at Pialligo. Griffin's decision to pursue cork oak forests at Canberra was apparently on the advice, in 1914 or 1915, of Donald Campbell, Superintendent of Tree Planting, Melbourne City Council. Campbell had also advised the Victorian Minister of Forests of the great virtues of the cork oak for wood, cork and food for humans (in times of famine) and pigs adding at the same time that he could not recommend the cultivation of pines on a large scale.<sup>40</sup>

Griffin's intervention created uncertainty. Progress on afforestation slowed and the years of 1916 and 1917 became ones of divided control and relative inaction.<sup>41</sup> Further planting did however proceed on Mt Stromlo as a follow up to Weston's initial work.<sup>42</sup>

### Weston, Johnstone, Campbell and Corbin reports

In July 1917 Griffin took unilateral action in another direction by attempting to involve another Minister in the affairs of the territory further complicating the afforestation question. He proposed a major afforestation scheme which would use 'Repatriation Funds' and provide employment for repatriated soldiers from World War I. His proposal emphasised particularly the potential of cork oak forests on the:

vast area of suitable land which has already been purchased by the Commonwealth and whose improvement will be entirely under the control of and accrue exclusively to the benefit of this Government<sup>43</sup>

This startling proposal was the catalyst for a number of significant reports. Weston's initial reports led in turn to the commissioning of three reports by external advisers on afforestation and its potential role in the Territory's economy. The first two, lodged in November 1917, were prepared by Donald Campbell, Superintendent of Tree Planting, Melbourne City Council (nominated by Griffin) and by J.T. Johnstone, Chief Superintendent, State Nurseries and Plantations, State Forests Department, Melbourne (nominated by the Department of Home Affairs and Territories). The third report, commissioned after the submission of these two. was lodged in April 1918 by H. Hugh Corbin, Consulting Forester in the South Australian Government and Lecturer in Forestry, Adelaide University. It was the most comprehensive one. These reports provided a valuable summary of

the good progress made already by Weston on afforestation. Generally speaking the potential of Monterey pine (*Pinus radiata*) as a plantation timber was confirmed. However Griffin's ideas on cork oak and redwood forests received little encouragement from Johnstone and Corbin.<sup>44</sup>

From a financial and political point of view, a major commitment to afforestation at that time appeared unlikely. On 11 October 1918 Patrick McGlynn, Minister for Home Affairs and Territories, informed the Federal Parliament he was uncertain about some ideas on major afforestation in the Territory. He spoke instead of a limited commitment initially. In particular he expressed reservations, consistent with the views put forward in the Johnstone and Corbin reports, about the viability of redwood forests, noting at the same time the 'great success [over] the last two years' with Monterey pine plantations on Mt Stromlo. He made no mention of the possibility of cork oak forests as proposed by Griffin. 45

# Afforestation achieved by Weston

In the wake of the Minister's resolution of the afforestation debate, sparked by Griffin, planting programs were expanded from 1918 onwards. By 1920 Weston had planted out 780,000 plants, <sup>46</sup> and by 1924 he had afforested over one thousand hectares (Table 1). However with the exception of Mt Stromlo much of the program was closed down in 1921 when city planting commenced. A brief summary of the afforestation projects he pursued follows.

Table 1: Afforestation planting areas, 1913 to 1924

Planting area Westridge: Westbourne Woods/Yarralumla Nursery		Area afforested, c.1924 (ha)	
			198.4
Mt Stromlo	•		476.0
Green Hills:	Roman cypress	3,2	
	Cedars (Dairy Hill)	8.0	
	Cedars	34.0	
	Cork oak plantation	8.0	53.2
Pialligo:	East Lake Redwoods		64.0
Inner Hills:	Mt Mugga	20.0	
	Red Hill	2.4	
	Mt Pleasant	12.0	
	Mt Majura	180.0	214.4
Cotter/Murrumbidgee:	Bullen Ridge		40.0
Total	<b>3</b> -		1046.0

Source: National Archives of Australia A 192, item FCL1921/1905

# Westridge area

Westbourne Woods and Yarralumla Nursery were sited and their planting initiated and executed by Weston in 1914 to a design prepared by him the previous year. Their siting there was later criticised by Walter Burley Griffin. Both areas

have survived, the arboretum now being leased by the Royal Canberra Club, while the nursery is still in use.

#### Mt Stromlo area

The installation of an observatory in 1911 was the initial catalyst for this project to stabilise the de-vegetated slopes and improve the 'atmospheric conditions'. Planting was initiated and executed by Weston in 1915 to his design. He used a wide range of species initially. As success became evident with Monterey pine and political support was gained in 1918, planting continued in the 1920s. It became a permanent pine plantation.

#### Green Hills area

All four plantings were initiated in 1918 by Walter Burley Griffin, who designed each and selected the exotic species used. The three green hills terminated one of his axial vistas from Capital Hill, while the cork oak plantation was part of his never realised 'continental arboretum'. Planting was by Weston. The planting on two of the hills and the cork oak plantation have survived.

### Pialligo area

This plantation of Californian redwoods was initiated by Walter Burley Griffin in 1919 on the future shores of his never-constructed East Lake. Weston, Johnstone and Corbin opposed Griffin's use of redwoods. By 1921, 104,000 trees had been planted by Weston with only 35,000 surviving. Further deaths and removals have occurred since and only a remnant survives today.

#### Inner Hills

Planting by Weston of Mt Mugga, Red Hill and Mt Pleasant was initiated in 1917 or 1918 by Walter Burley Griffin under the latter's 'coloured hills' concept. Planting on Mt Majura was initiated and executed by Weston in 1919 following a report from him about the vegetation destruction that had occurred there. All plantings have survived to the present.

# Cotter/Murrumbidgee area

Despite proposals by Weston for planting parts of the Cotter catchment area, none was ever funded in his time. Stabilisation by planting of the steep fall from Bullen Ridge to the Murrumbidgee River was initiated by Weston in 1919 to his design.

# Aftermath

Political support for afforestation in the Federal Capital Territory remained weak in the early 1920s and limited progress was made on the implementation of the Corbin report. Weston was able to continue with Monterey pine planting on Mt Stromlo. In 1924 he made further recommendations about afforestation of the Cotter Catchment area near the recently constructed water supply dam but with no apparent response.<sup>47</sup>

#### Lane Poole's influence

The situation changed in 1924, with the appointment of Charles Lane Poole, an experienced forester, as Commonwealth Forestry Advisor. His appointment had been preceded by a series of interstate forestry conferences commencing in 1911, which had canvassed a range of national forestry issues, including the reservation of forest areas, the need for softwood plantations, and professional education. At the Sixth Interstate Forestry Conference in 1922, the meeting:

resolved that every effort should be made towards afforestation of the extensive tracts of available and suitable waste lands (i.e. vacant crown land) in the states so that the nation might become self-supporting as rapidly as possible.<sup>48</sup>

In the case of the Federal Capital Territory, Lane Poole brought the issue to a head in April 1925. In a report to the Federal Parliament he canvassed the possibilities for substantial afforestation in various parts of the Territory including '1500 acres [600 hectares] per year within the [Cotter] catchment', <sup>49</sup> and the appointment of a qualified forester and other staff. Lane Poole was obviously impressed with Weston's foundation work and his report included the following:

His arboreta to-day represent the labour of many years, and in them may be seen specimens of all the trees that can possibly be grown in that climate. His pinetum is of particular value, containing as it does a fine collection of conifers. This alone will save the forester who starts planting for timber ten years of tiresome and, with many species, disappointing experimental work. This pinetum enables me, without further trouble and expense, to say quite definitely that a certain small number of species is satisfactory, that others are doubtful and that a large number are not worth planting at all. <sup>50</sup>

Lane Poole's proposals were taken up. In March 1926, shortly before Weston's retirement, G.J. Rodger commenced as Chief Forester of the Federal Capital Territory.<sup>51</sup>

Lane Poole's report settled also the long-standing question of a national school for professional forestry education. In particular it stated that the 'Federal Capital Territory has a sufficiently wide range of forestry conditions to make a satisfactory site for the proposed school'. Another advantage Lane Poole saw with the Canberra site was that 'students can acquire from Mr Weston's work much valuable knowledge, and learn to know all the best introduced species'. <sup>52</sup> The Australian Forestry School was constructed in Westbourne Woods and officially opened on 11 April 1927. <sup>53</sup> Weston's arboretum, his afforestation areas and the Territory's indigenous forests became a valuable teaching and research resource for many decades to follow. Until 1965, when the School was transferred to the Australian National University, 584 students had been educated there. <sup>54</sup>

Weston's afforestation work was expanded. G. J. Rodger commenced an ambitious pine plantation program of 200 hectares per annum. Further arboreta were planted. During the depression the planting rate was extended and by the mid 1950s there were 6,600 hectares under pine plantation in the territory. At the thirtieth meeting of the Australian and New Zealand Association for the Advancement of Science, in Canberra in 1954, Rodger and Jacobs reported on the

'sound foundation for later development' in forestry laid by Weston.<sup>55</sup> Pine plantation establishment continued and today there are 15,700 hectares established.<sup>56</sup>

# Weston's influence on contemporary Territory planning

With the major expansion of the Federal Capital from the 1960s onwards Weston's afforested and naturally regenerated hills adjacent to urban areas became a key planning element. These hills helped to reinforce the 'city in a landscape' effect. As Canberra grew as a series of new towns in their own valleys, the surrounding hills were protected by broad planning policies to provide both a backdrop and containment to the urban areas and also places for recreation and conservation. In most cases the native species hill landscapes were allowed to regenerate by controls on grazing. In the case of Weston Creek urban area, Weston's original use of Monterey pine on the nearby Mt Stromlo was extended to ensure a visual integration of urban development into the existing landscape. Further consolidation of these broad landscape policies was pursued by the National Capital Development Commission in the 1970s and 1980s. In 1975, it published a land use plan for the Australian Capital Territory which identified key landscape areas, including hill reserves, river corridors, nature reserves and pine plantations.<sup>57</sup> These areas were recognised collectively as the National Capital Open Space System.

### Vision, determination and political astuteness

Weston's afforestation and conservation achievements in the foundation days of the Federal Capital Territory may not have been possible if a favourable political environment for this type of work had not been evolving in New South Wales at that time. That political environment was the product of two significant movements. First there was growing recognition of the need to protect rural landscapes and to plant new forests. In New South Wales Joseph Maiden had an important influence over the way that state was responding. It is not surprising therefore that what happened at the federal capital site reflected Maiden's views on afforestation and conservation. Weston's creation of a major nursery and arboretum, and the commencement of experimental programs to test plants for suitability to the Territory's growing conditions were consistent with the way Maiden would have acted. Second, as part of the 'city beautiful' and 'garden city' movements, there was a growing appreciation of the importance of tree planting in and near cities for wood production, recreation, conservation and landscape appreciation. Interestingly Maiden was involved in this movement as well, particularly with his involvement as a Council member of the Town Planning Association of New South Wales.

Notwithstanding these favourable political conditions for afforestation and conservation Weston's progress was far from easy. Serious political difficulties existed over the building of the federal capital. World War I broke out shortly after Weston's arrival. In addition he became caught between two quarrelling parties over the planning and development of the capital which led to a Royal Commission. On one side was Walter Burley Griffin and on the other Griffin's

political and bureaucratic opponents. Weston was in the middle. Despite the conflict Weston was able to steer a steady course towards his afforestation and conservation vision for the federal capital site.

Charles Weston deserves recognition as a key achiever in the birth of the environmental movement in Australia in the early decades of this century. As an immigrant he brought to his adopted country enormous drive and energy and a burning ambition to apply his horticultural knowledge and experience to the benefit of the new Commonwealth of Australia. That burning ambition was translated into his horticultural vision for the federal capital site. It was a vision that has had a long term impact on the progress of afforestation, conservation and landscape architecture in Canberra and in Australia generally.

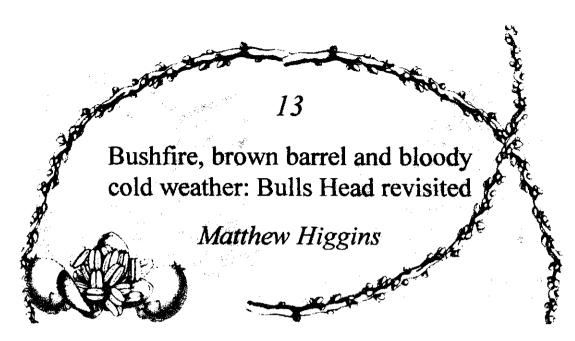
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'Bulls Head? Why would you want to know about that cold, bastard of a place?'

(former Bulls Head worker)

The Mt Franklin Road runs south along the Brindabella Range, on the ACT-NSW border west of Canberra. A few kilometres from its start at the junction known as Piccadilly Circus, the winding road makes a sweeping right hand curve, then commences to swing to the left. Just at this point the snowgum forest opens up in front of you, there is a carpark, a grassy swath dotted with barbecues, a stone shelter and a toilet block. Welcome to the Bulls Head Picnic Area. Enjoyed today by picnicking visitors to the range, Bulls Head was once a forestry settlement and the highest village in the ACT. It survived snowstorm and gale from the late 1930s through to the early 1960s when logging closed down. Only a few subtle signs remain today to inform the average visitor of the houses that stood here, and of the little community which once called Bulls Head 'home'.

From the mid 1940s Bulls Head functioned as a hardwood logging centre, supplying post-war Canberra with urgently needed, and scarce, building timber. But the settlement began life a few years earlier with another purpose: bushfire prevention.

Late in the 1930s Doug Maxwell was appointed there as the first forestry ranger. He and wife May and their two young sons Graeme and Colin occupied a newly built weatherboard house—miles from anywhere and the only real residence on the entire range. The dreadful 1939 bushfires which tore through the Victorian and NSW high country and entered the ACT showed how easily a bad bushfire could seriously threaten the national capital from the west. Bulls Head, located on the Brindabellas to the west of the city, was the base from which such a threat could be dealt with.

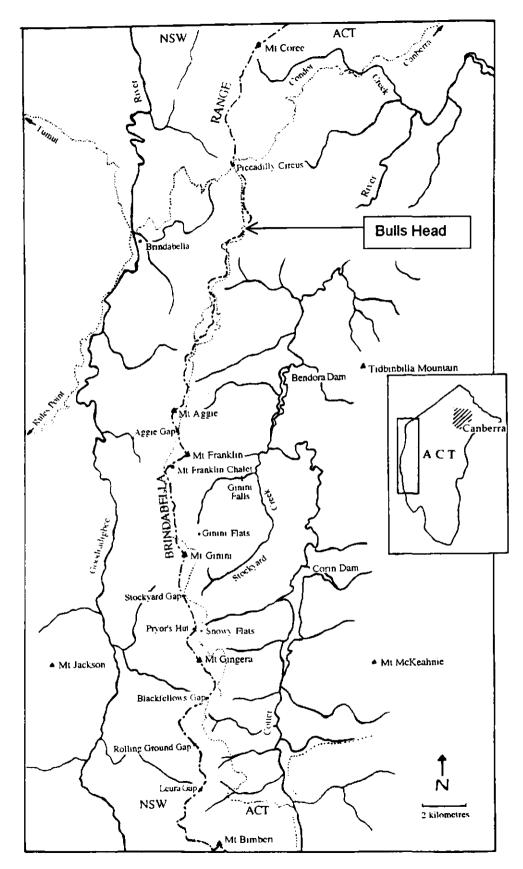


Figure 1: The Brindabellas

Through the 1940s Doug and fellow rangers like, at different times, brother Lach, Vince Oldfield, Bill Jemmett and others carried out a variety of bushfire duties. They burned off, erected a series of fire towers at strategic points and staffed them each summer, and made firetrails. The tower at Brindabella Mountain was built into the top of an ancient snowgum. Another out at Bag Range was erected by Vince Oldfield and Norman Coulton; Vince recalls how the materials were carried in on a slide (or bush sled) pulled by a chestnut horse, and how batteries for the two-way radio at the tower were recharged by a wind generator on site.

Horses were stabled at Bulls Head and were integral to the rangers' work; there was then simply no other means of transport through the mountain bushland. Vince says, 'You had to travel everywhere with a pack horse, a couple of blankets, and chuck 'er down wherever it come night'. Sometimes the men were away from home for 16-day stints. Tents were used, but only in winter; sleeping bags were unheard of. To assist the rangers' work in the northern part of the range Coree Hut was constructed near Coree Flats, beneath Mt Coree, in the 1940s, its brick chimney being built by Bulls Head employee Kevin Primmer.

Forestry officers, Lindsay Pryor and subsequently David Shoobridge, oversaw Bulls Head for some years and rode with the rangers (including Upper Cotter ranger Jack Maxwell, Doug's father) on numbers of trips out towards Long Plain, Currangorambla and other northern areas of what is now Kosciuszko National Park. The men assessed the fire hazard and liaised with snow lease graziers so that the latter would be more careful with their seasonal burn-offs. Radio was vital in fire control and reporting work, and Pryor (later Superintendent of Parks and Gardens in Canberra and subsequently the inaugural Professor of Botany at the Australian National University) had several permanent aerials—to which he could hook up—installed at points like Aggie Gap. He began carrying radios into the bushland by pack horse—with the radio on one side of the horse and batteries on the other. Pryor also helped lay the groundwork for the Commonwealth's lease from NSW of land to the west of the Territory in order to further exercise control over the bushfire problem.

The establishment of Bulls Head was seen as crucial in bushfire-prevention terms. When the question of deferral of rangers' military service arose in January 1942, Pryor wrote of Doug Maxwell and Oldfield as 'Bushmen of special experience and ability stationed on the ACT boundary for fire protection work which extends throughout the year. These men are the most important in the fire protection work in the ACT'.

Of all the Bulls Head rangers, Doug Maxwell was probably the most revered for his riding skills. Shoobridge says, 'Doug was a real bushman. He was born and bred into that country, and amongst horses'. Logging contractor Murray Colless told of how late in the 1940s he saw Doug ride down a mountainside: 'Gawd blimey...he come down and the old horse was on his haunches slithering down...I wouldn't have thought anybody could ride a horse through that sort of country, but he could'. Little wonder then that a favourite pastime for men like Maxwell was brumby running.

In addition to their bushfire work, the rangers at Bulls Head had a few other tasks. They assisted with the arboreta, the series of trial plots of pines and other exotic species established by the Australian Forestry School and, more often, the Forestry and Timber Bureau. Between the 1920s and the 1960s over thirty arboreta were planted in the ACT (most of them in the Brindabellas), all to ascertain which species had the greatest commercial potential. Bendora, Snow Gum and Stockyard Creek arboreta were all established in the early 1940s and the Bulls Head staff helped with clearing of the plots, planting, fencing, and control of wombats and kangaroos which were seen as a threat to the young trees. The rangers also patrolled parts of the Cotter River valley whose catchment had to be kept clean as the source of Canberra's drinking water. Illegal grazing was a particular threat to the catchment which the rangers had to guard against.

Apart from the Maxwells' house, the other accommodation at Bulls Head consisted of timber 'cubicles' which were pretty rough. Some of the timber for one came from the Lees Creek sawmill, down on the Cotter River side of the range. Begun by Rayner and Peterson in 1934, the small mill was steam-powered and horse teams snigged the logs in from the bush. Production early in the mill's life was around 7000 super feet a week. Such was the degree of concern about maintaining the purity of Canberra's Cotter water that the operators were forced for an initial period to camp outside the catchment, over the top of the Brindabellas, and walk down to the mill daily. One of the several handicaps resulting from this for the millers was that it made it difficult to get up sufficient steam early in the morning at the mill, because of the time taken to walk down to the site each day. After protesting this arrangement, the men were allowed to live at the mill, but subsequent health inspections in 1936 found the creek badly pollutedvindicating the early precautions. Glyn Cavanagh took over the mill that year after Rayner and Peterson got into financial difficulties and he ran it until 1939. Very little of this historic mill remains today.

With the end of the Second World War, Bulls Head entered a new period of activity. As Colin Maxwell recalls of this part of his boyhood, 'life changed pretty quickly after the war'. With building timber in very short supply, the government decided to exploit the forests of the eastern watershed of the Brindabellas in order to cater for Canberra's expected post-war building development. No sawmill was erected at Bulls Head; rather the logs were brought out through there and trucked down to the government mill at Kingston in Canberra. The settlement's bushfire role remained significant, for a fire tower was erected at Bulls Head itself in 1948 (it stood for nearly twenty years). From early 1947 when logging commenced, through to 1962 when it finished, 47,000,000 super feet [156,000 m<sup>3</sup>] of timber were logged. For people living in a Canberra home of that vintage, chances are that their hardwood frame might be made with brown barrel (Eucalyptus fastigata) or alpine ash (E. delegatensis) which were the two main types of eucalyptus sought by the loggers. Small amounts of mountain gum (E dalrympleana) and ribbon gum (E. viminalis) were also taken. The logging took place on the eastern flank of the range, down below the snowgum (E. pauciflora) forests which dominate the range's top.

Table 1: Quantity of log timber cut, 1946/47-1955/56

Year	Quantity of log timber cut		
	(super feet)	(cubic metres)	
1946/47	1,431,655	4,307	
1947/48	3,733,765	11,236	
1948/49	3,201,326	9,635	
1949/50	3,754,594	11,300	
1950/51	6,410,095	19,294	
1951/52	3,016,459	9,078	
1952/53	3,238,029	9,746	
1953/54	2,192,087	6,598	
1954/55	1,197,163	3,603	
1955/56	1,703,726	5,126	

The little settlement's population rapidly expanded as Tocumwal houses (houses moved from the RAAF base at Tocumwal NSW, and having distinctive fibro and weatherboard wall cladding) and more cubicles were erected. More government forestry employees were appointed—to mark trees to be felled and to measure logs, and to build the network of access roads that remains on the side of the range today. And then there was the logging contractor, his fallers and truck drivers. Numbers of predominantly eastern European migrants, recent arrivals in Australia, also joined the Bulls Head workforce. Some of the new buildings had their problems; Maurice Franklin occupied one of the Tocumwals with his wife Joyce and he complained to authorities of leaking windows which, after 400 millimetres of rain in six weeks, became 'a serious inconvenience'! These houses were rented to the government employees at ten per cent of the men's wages; thus in 1948 the rent was 13s 6d per week, the wage being £6 15s.

Colless Brothers were the contractors right through to the end. Brothers Bill and Murray came up from Victoria where at Noojee they had logged mountain ash (*E regnans*). Murray, fresh from the air force, actually flew over the range to assess its potential. In forestry terms the Bulls Head forests were not highly productive and the stands of merchantable timber were small and scattered over difficult terrain. David Shoobridge recalls that it was difficult keeping up with demand 'So for most of that operation we had the sawmill right on our tails looking for more timber all the time'. Production figures are not available for every year, but the quantities of log timber cut during the first decade are shown in Table 1.

Colless's methods were vastly different from those for the mill on Lees Creek. Now there were tractors, bulldozers, winches, and even a Bren gun carrier. Colless's Victorian fallers began with axes and crosscut saws, but soon chainsaws came into use. Mind you, the early two-man chainsaws were very unreliable and a crosscut in the right hands was quicker. But then one-man chainsaws evolved through the 1950s. Forestry road-making too was mechanised—Shoobridge very quickly got hold of a D7 bulldozer which only shortly before had been used in for landing Allied forces at Finschafen in the New Guinea campaign.

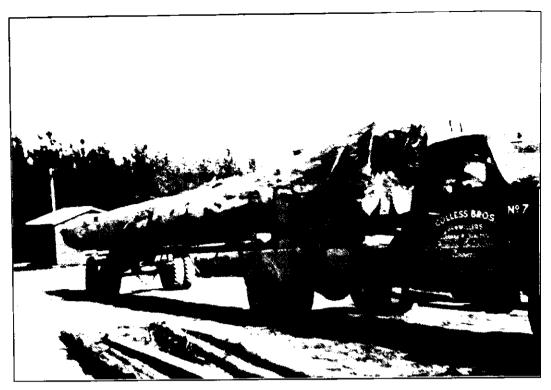


Figure 2. One of Colless Brothers' trucks, loaded with a brown barrel log from the Bulls Head forests, at the firm's Weston Creek sawmill in about 1956-57. The driver is probably Joe Kendall. Photo: Murray Colless Collection

Collesses snigged logs out to loading ramps through combined use of their tractors and winches. The average distances snigged, until at least the mid 1950s, were around 400 metres, although they could be more than twice that in some parts of the range. The contractors had to re-tender each year for the logging contract and Colless's tenders averaged around 18s per 100 super feet [0.3 m³]. Other firms did bid for the contract, and in 1954, for example, the unsuccessful tenderers came from Taree, Leichhardt, Whittlesea and Yerrinbool. Both the archives and the oral record indicate that the relationship between Collesses and the government forestry authorities was a good one. But it was not without its disagreements which included reprimands from the authorities over the taking of some unbranded trees and certain other malpractices in the early 1950s.

Two to three truckloads of logs were brought down from the range each day (the average log containing about 1500 super feet [4.5 m³] of timber), and trucked either to the government mill or to Colless's mill at Weston Creek. On the narrow mountain roads the log trucks caused some anxiety for other road users, and Mt Franklin skiers regularly voiced their anger about the chewed-up roads. Given the inherently dangerous nature of logging, it was perhaps remarkable that there was only one fatality, and that was on the roads. Log truck driver Bruce Cameron hit a tree on Warks Road, and his load slid forward, crushing him.

Today much of the heat in the forestry debate concerns woodchipping and clear-felling. In the Brindabellas neither of these was relevant, for there the

logging was of selected trees. None the less, the logging was intensive at times. From Canberra the loss of trees was not visible, but around one area of the range (still known as Tatternalls Landing) felling was almost wholesale. Those involved, when asked about the degree of damage done at the time, point to the forest's successful regeneration. True, many areas logged bear little sign of it now and casual visitors to the range might never know that chainsaws and dozers had been anywhere near. Still, the more trained eye also sees, say along Parrot Road, the smaller, even-aged stands which show that it will probably be many years yet before those trees will offer the old nesting hollows needed by many of the range's birds and mammals.

Because the logged forests were inside the Cotter catchment, the government was conscious of guarding against too much disturbance of the soil. This was translated into various restrictions, including limitations on how close logging could go to tributary creeks. Though the main reason for logging coming to an end in 1962 was lack of viable timber, concerns to maintain a healthy catchment also appear to have played a role, especially with Bendora Dam having just been completed below Bulls Head, and Corin Dam to be built shortly after.

Logging was only interrupted by winter. It was this season that always had the biggest impact on Bulls Head's residents. Fully exposed, the village was open to strong winds at any time of year, but winter was worst and on a number of occasions the settlement got snowed in. Though people stocked up with provisions beforehand, it was sometimes not enough. Graeme Maxwell: 'Oh, we often got snowed in. We had more feeds with bread and dripping than anything else, during the winter'. The phone line, a party line which ran from tree to tree back to the forestry settlement at Uriarra, was regularly broken by snowfalls, further isolating the place.

Graeme recalls when his family returned home one winter weekend to find the pipe from the water tank had frozen and burst, leaving a sheet of ice right across the floor. 'Dad opened the front door, and ended up on his arse on the floor with his feet up at the back door.'

Vince Oldfield told of the difficulties of riding around the wintry range once. 'It had snowed, and the ice sets on the leaves and then you get a wind blowing...and she blows little slivers of ice off...It's frightful if it hits you in the face...And the horse won't go into it, the horse will nearly go sideways, you know, to try and back into it.'

Still, residents made the most of it, and a few had a go at skiing. Skis were sometimes necessary to reach the mailbox down the road at Piccadilly Circus. Bulls Head people also often had to rescue skiers caught in vehicles in the snow further along the range, and many times privacy was interrupted when the phone rang late at night with Canberrans inquiring about the state of the road. Doug Maxwell assisted many skiers to get to Mt Franklin Chalet by taking their gear on his pack horses through the snow. And in the mid 1950s when Franklin Chalet was booked out, skiers rented one of the houses at Bulls Head. Perhaps the one time Bulls Head was in the headlines was in 1964 (two years after logging ceased) when it became the centre of a search and rescue operation for Australian

National University skiers snowbound at Franklin. The Australian newspaper, which was being launched at the time, carried the story on the front page of issue number one.



Figure 3. A group of skiers in front of some of the Bulls Head houses in July 1956. Note the fire tower in the background, and the young pines behind the houses. The tower and houses are long gone today. The pines are now well grown and are the strongest landscape feature at Bulls Head. Photo: Alan Bagnall collection.

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Apart from the trips to Queanbeyan or Canberra there was some social contact nearer at hand. Dances were held at Uriarra and the Maxwells and maybe others from the little village looked forward to these outings.

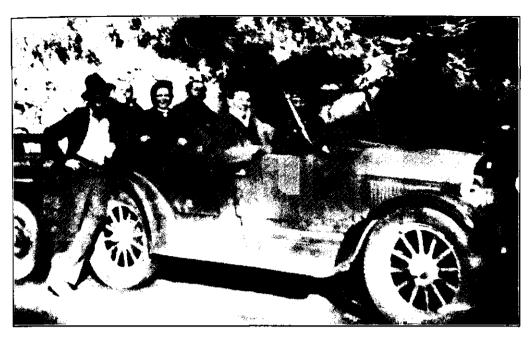
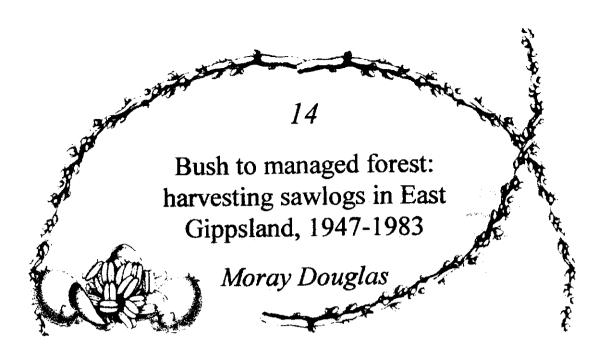


Figure 4 Off to town! Left to right Tom Murray, Normie Brown, Eileen Poke, Laurie McLaren and Dave and Phyllis Gaskett, in Bill Jemmet's car. Photo: Murray Colless collection.

For one of the families at Bulls Head in the early 1940s however, the weather, combined with the isolation caused by the husband's frequent long absences on forestry work, contributed to the break-up of the marriage. But for those who were better adapted, they carried away fond memories when eventually they left. David Shoobridge probably summed this up best when he said, 'It's pretty remote up there, it's an isolated place to live. But to someone like [the] Maxwell[s], and...the Franklins [and other bush people there] that's life; they liked it, it suited them down to the ground. But to anyone brought up and reared in the city, they'd go crazy I should say'.

# Acknowledgement and sources

Matthew Higgins attended the 'Australia's Ever-Changing Forests IV' conference with assistance from the ACT Government through its Cultural Council. The spoken version of the paper presented at the conference included an audio-visual segment combining slides and extracts from oral history interview tapes. The paper is largely based on the oral history project 'Bulls Head and the Arboreta', conducted by the author during 1994-95 with the assistance of funds made available by the Commonwealth of Australia under the National Estate Grants Program. The project was carried out under the auspices of the National Trust of Australia (ACT). The report includes a bibliography of National Archives files consulted in the course of background research. See also Higgins, M. 1994. Skis on the Brindabellas. Canberra Tabletop Press.



### Introduction

East Gippsland is one of the most heavily forested parts of Australia. My first impression as a young forester, as I travelled to Bendoc in 1950, was that the forests went on for ever, there was nothing but bush, bush and still more bush. Today the forests are still there, but there have been great changes; roads have been built, areas harvested for sawlogs, and the mature trees replaced by regrowth. The bush to some extent has been tamed and turned into a managed forest.

The utilization of timber from East Gippsland's vast forests commenced in 1861 with cutting timber from the durable red gum and grey box trees in the western part of the region and around the Gippsland Lakes. Building the Bairnsdale-Orbost railway in 1917 extended the exploitation into the coastal forests as far east as Orbost. However, up to the end of World War II, it was still largely confined to sleepers, beams and similar products. Sawmilling was limited to meeting the small local demand because the high freight costs prevented sawn timber from competing on the Melbourne market.

But the destruction of forests nearer to Melbourne in the 1939 fires, and the post-war housing and construction boom, created a great demand for sawn timber from East Gippsland's forests. The first sawmills were established in 1947 and from then the harvesting of sawlogs rose steadily to peak in 1979/80 at 560,000 cubic metres a year, more than half the total production for the State. For the period through to 1983 some 15,000,000 cubic metres of sawlogs were harvested from aproximately 230,000 hectares of forest. It was, in any terms, a major forest operation.

This paper is based broadly on my recollection of the field management of sawlog harvesting in East Gippsland. This was only one facet of the broader issues of forest management; but in the field, it was largely managing the sawmillers and their operations. The Forests Commission Victoria, was responsible for the management of the forests for the period covered by this paper. In 1983 it was absorbed into the Department of Conservation Forests and Lands which took a completely new approach.

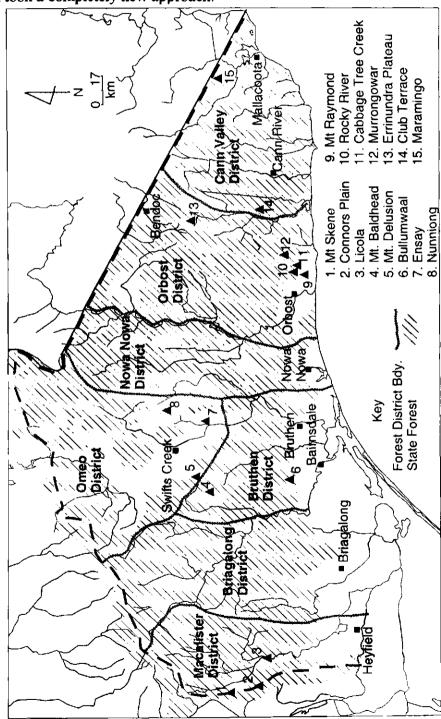


Figure 1: Locality map of East Gippsland forests

### The forests

For the purpose of this paper, East Gippsland is taken to comprise the East Gippsland Shire and the northern part of the Wellington Shire, i.e. from Heyfield to Mallacoota. The forests of the region are vast, some 2 million hectares, or two-thirds of the total area of the region. A great range of forest types occur: alpine ash, mountain ash and shining gum forests in the mountains; messmate, mountain gum and manna gum forests (high elevation mixed species) on the upper slopes; stringybark, gum and silvertop forests (mixed species) on the foothills and along the east coast; with dry peppermint or box forests along the inland valleys. There is a bewildering array of eucalypt and undergrowth species. In 1947 the forests were dominated by mature and over-mature trees, frequently showing signs of fire damage. Some stands contained high volumes of saw logs, but over large areas the volumes per hectare were only moderate or low. Areas of alpine ash resulting from the 1939 fires were the only regrowth of consequence.

The forests were on public land. Except for some 10,000 hectares of parks and reserves, they were under the management of the Forests Commission for harvesting of timber. Most, but not all, of the commercial forests occurred on the 500,000 hectares of Reserved or Permanent Forest. The remainder was classed as Protected Forest. In practice the difference in tenure had no impact on the way the forests were managed.

This land status changed completely with the adoption of the recommendations of the Land Conservation Council on the use of all public land of East Gippsland in the late 1970s and early 1980s. This body was set up to determine the most appropriate land use for all public land, with an emphasis on conservation through the creation of more National Parks and other conservation reserves. The changes in the designated land use were radical, but they had little impact on forest management until after 1983.

### Administration

In 1947 the Forests Commission's headquarters were in Melbourne, with Regional (Divisional) headquarters at Bairnsdale and Warragul, and District headquarters at Briagalong, Bruthen, Nowa Nowa, Orbost and Cann River. With commencement of logging at Connors Plain in 1949, Briagalong was split in two, with a new district, Macalister, being created with its headquarters at Heyfield. In 1960 the Omeo District was established as a separate District, with its headquarters at Swifts Creek. Each District Forester had the responsibility for the day-to-day activities involved in forest management within his District. The Divisional Forester had a co-ordinating role, and had to ensure that Commission policies were being implemented and its directions followed.

Forest activities in the Region up to the end of World War II had been relatively low key. But after the war the rapid increase in timber harvesting and associated operations put great strain on the staff, infrastructure, transport, earth moving equipment, accommodation etc. Though there were some increases in

staff and transport, these fell well short of requirements to cope with the increased level of activity. However the situation gradually improved, and by 1970 the staffing and infrastructure were generally adequate.

# **Expansion begins**

The Commission had the management responsibility for all of the commercial forests in the State. It endeavoured to meet the demand for sawn timber for Melbourne. Up to 1947 the supply of sawlogs to meet this demand had come from the mountain ash forests north-east of Melbourne, but with their destruction in the 1939 fires, the Commission looked to open up other resources and in particular to East Gippsland, where large areas of commercial forest were known to exist.

Timber reconnaisances were carried out and based on these in 1943, Inspector Galbraith prepared a plan for the development of the industry in East Gippsland (Galbraith 1943). More detailed assessments were then undertaken and using the resource information they provided, from 1947 on, licences were issued to saw-millers located at Heyfield, Bruthen, Orbost and other centres across East Gippsland. A number of mills were congregated together in the new townships of Cabbage Tree Creek and Club Terrace. The initial licences were issued to mills displaced by the completion of the salvage of the fire-killed timber. As this rapidly came to an end there was a quick start up in East Gippsland in order to maintain, and in fact, increase the supply to the market, to meet the burgeoning post-war demand for housing.

The Commission kept control of the sawmill industry centrally through the issue of licences to sawmillers for set allocations (volumes of sawlogs) from designated areas (logging units). These were issued annually, but normally with an assurance of being renewed for at least 10 years. In practice these were invariably renewed while any timber remained. It was through the issue of these licences and the allocations set, that the Commission determined the level of sawlog harvest for the State and for the Region.

# Field management, the task

With the sawmiller having a licence and a logging unit, it was now up to the foresters to plan and manage the operations associated with the harvest. Planning and managing the harvesting of the sawlogs from the forests of East Gippsland presented some major problems. In 1947, the information on the location and quantity of the timber resource was limited and unreliable. The sawlogs were found in trees of many different species. The trees varied greatly in size, age and soundness, many had been severely damaged by fires and the merchantable volume of sawlogs per hectare, varied enormously. The great distance the sawmills were from the market limited the opportunity to sell low grade material and confined utilization to the better grade of tree. Many of the timber stands were remote and to access them, extensive road construction was necessary. The

magnitude of the task facing the foresters was huge. Somehow the harvest had to be managed in an orderly manner and a new crop established. Few staff had experience in harvesting operations on this scale and the principles taught at Forestry School were of little help, as these were largely based on European forests which had been under continuous management for over 100 years.

### Locating and accessing the timber

Though assessments and reconnaisances had been undertaken on many of the areas to be harvested and were used to determine the logging units, these were of little value in planning the harvest. The volumes could not be related to the individual coupe (cutting section) and it was up to the Commission supervisor or the sawmiller to locate the stands. Similarly the topographic maps were only of limited assistance in planning road location. The availability of maps based on aerial photos in the early 1950s was a big step forward and the photos themselves greatly assisted in the location and assessment of timber stands.

The necessity for the development of extraction roads into the forests was recognized from the start. The Commission undertook the responsibility for the major roads required to ensure access to log supplies for a number of millers. Initially these included the Licola-Connors Plain Road, the Bruthen-Mt Baldhead Road and the Lind Park Road at Club Terrace. Later many other roads were built. The sawmillers were allocated small logging units along these roads, usually sufficient for 2-3 years harvest.

In locations such as Nowa Nowa, Orbost and Cabbage Tree Creek, the initial logging units were allotted based on access already provided by the network of Country Roads Board or Shire roads. Some millers such as Ezards at Swifts Creek, did their own development roading, including improving shire roads where necessary. Others including Collins at Ensay, upgraded existing Commission roads to a standard suitable for log extraction, but this created problems as to who was responsible for the maintenance of the road. In these situations the logging units were large enough to meet the sawmiller's annual allocation for at least 10 years.

In all cases sawmillers had to develop their own internal roading within the logging units. Commission approval for the route of these roads was required, normally this was a formality, though whenever possible, Commission supervisors would run the grade line for these roads to ensure that they were on a good alignment.

# Management by the sawmiller

It was the responsibility of the Commission supervisors to oversee sawmillers' operations on their logging units. They were expected to approve the location of the internal roads and to ensure that all the utilizable timber was cut, before allowing the fallers to move to a new site. But their prime role was to ensure that royalty was paid on all logs cut. These were to be checked for measurement, and allowances given on faulty logs before they left the forest.

With the few small mills, supervisors were able to exert tight control over the sawmiller's logging operations. The sawlogs were marked for felling and each log

was checked at the stump, prior to its removal. This official policy persisted as late as 1949, but with the enormous increase in the volume of saw logs being harvested it had to go by the board. Between 1947 and 1951, Mark Lay, at Cabbage Tree Creek, went from supervising one mill with an allocation of 5000 cubic metres, to 6 mills with an allocation of 60,000 cubic metres. This was broadly repeated across the Region. All the supervisors had time for was to check as many logs as they could, ensure the fallers had log or tally books, collect these, and prepare the accounts.

To all intents and purposes the management of the forest was in the sawmiller's hands. Some did this well and efficiently; kept in front with their roading, left reserves for wet weather and saw that fallers completed their areas. But these were in the minority; with most, their roading was behind and they had no wet weather reserves. Frequently the logging was in the hands of contractors who raced through the logging unit taking only the best and easiest to extract logs—not suprising as they seldom had security of tenure.

I had personal experience of the situation when, in addition to numerous other duties, I supervised two sawmills in the Orbost district with an allocaton of 21,000 cubic metres. I too, found it was impossible to control the operations effectively or to influence the condition of the forest when logging was completed. The millers engaged or sacked fallers at will. On one occasion a sawmiller started 6 sets of fallers on one day and when the mill had enough logs put them all off again. It was impossble to keep up, let alone see that they cleaned up their areas—often next time a completely new set of fallers would be started. A major problem was the doubtful soundness of the trees. Fallers could be directed to fell a tree, but this was rarely done, for if the tree was unsuitable for a log, i.e. a cull, the faller had to bear the cost. Felling by axe and crosscut saw was hard and it was difficult to tell if the tree would make a log. With the marginal economics of the industry at that time, sawmillers would only accept sound or nearly sound trees, so it was inevitable that a substantial proportion of the original crop was left standing. Sawmillers complained frequently about log measurements and inadequate allowances for fault, so supervision time was concentrated on those aspects.

This basically was the situation throughout the coastal and foothill forests across the Region through to the end of the 1950s. The position in the mountain ash and high elevation mixed species forests was, if anything, worse. In undamaged forests a high percentage of the stand was removed, but in most stands a significant number of large old, usually fire-damaged, trees of doubtful soundness were left, so utilization could rarely be said to be complete. The position was better in the alpine ash stands because of the inherent soundness of the trees of this species. The District Forester in Heyfield, Ian McDonald, reported in 1950 in the first District Annual Report, that in the initial operations on Connors Plain, fallers were felling all the merchantable trees but there was a great deal of waste, with logs less than 10 metres long left behind.

### Regeneration concerns

Early experience in East Gippsland had shown that the coastal forests regenerated well in large openings, so initially it was expected that the logged stands would regenerate. However it gradually became apparent that this was not the case. I thought this might only apply in the Orbost District, but I found on a visit to Bruthen in 1954 that regeneration was sparse on the logged areas there as well. There was no official policy or directions regarding regeneration establishment—it was left to the individual District to take what action they thought necessary, but as there were no funds, this was very little. The major problem was the very large number of residual trees left standing, and cheaper ways of falling trees were investigated. In 1955 a trial in the Orbost District included falling trees by gelignite. Enriching natural regeneration by planting seedlings was also tested. (Heather 1955) The burning of the fallen tree heads (slash) was becoming more common as a fire protection measure and this increased the regeneration stocking, but overall there were very few adequately stocked areas resulting from the first 10 years of harvesting.

### Taking back management of the forests from the sawmiller

Circa 1960, a number of factors combined to change dramatically the relationship between the forester and the sawmiller. The economics of the industry had improved and sawmillers would accept logs with significant defect. The readily accessible coastal forests had been cut through and millers were willing to accept recutting of these for part of their allocation. The introduction of cull felling payments, (reimbursement by the Commission of the cost of felling trees which proved unmerchantable) enabled supervisors to ensure that logging areas were fully utilized. The use of reliable one-man chainsaws greatly reduced the cost of felling and preparing logs. Trees with short logs were fallen and defective butts removed.

It is hard to overestimate the value of these factors. It meant for the first time that logging areas could be completely cut out and with the extension of cull felling to the logging of new areas, that utilization could be completed in one pass. However due to lack of funds and insufficient staff, (Park 1962) it was sometime before this situation could apply to all logging areas. But with the gradual increase in the number of supervisors, the greater availability of transport, and in some cases the establishment of log-checking stations, by the end of the 1960s, supervisors were properly supervising the utilization operations, including tree marking when required. Initially priority was given to re-cutting previously selectively cut areas. The Orbost District Forester, Gerry Griffin, had millers engaged solely on recutting for a number of years.

With more time available, supervisors were able to become actively involved in the management of the logging units, in particular with checking the resources available, the planning of the harvesting operations and the location of logging roads. By 1970 Commission field staff were taking over from sawmillers the major planning of the harvesting operations.

# Regeneration, the aim

With the harvesting operation having removed all the logs, it was now possible to concentrate on ensuring that regeneration established on the harvested coupes.

#### Coastal and footbill forests

Following successful trials, regeneration felling was introduced in the readily accessible forests of Bruthen and Nowa Nowa in 1958. This was the first deliberate regeneration treatment applied in East Gippsland and involved the removal of the remnant trees through the sawmiller agreeing to fall all the trees on the area at his own expense, in return for obtaining an additional volume of logs. This later extended to other Districts. With the application of cull felling to the logging of all areas to achieve 60-75 per cent canopy removal and with the almost universal application of slash burning, by 1965 most of the harvested areas in the coastal and foothill forests were being regenerated to an adequate stocking level.

### Alpine ash forests

There were also problems with obtaining regeneration in the alpine ash stands. A survey of the cutover areas at Connors Plain in 1964 showed that over 70 per cent were below the desirable stocking level (Cowley 1965). At Swifts Creek in 1958, good regeneration was establishing on areas cut for pulpwood after the logging, but elsewhere it was poor or patchy. But the problem here was not the remnant trees as research by Ron Grose into alpine ash regeneration had established:

an adequate seed supply coupled with a receptive seed-bed created by fire or by mechanically disturbing the soil is the most important factor necessary to promote regeneration (Grose 1957).

Trials undertaken at both Mt Delusion and Nunniong in the Omeo District from 1958-1960 showed that the autumn slash burns were much more effective than spring burns and that it was possible for alpine ash stands to carry virtually no seed. Direct seeding trials were undertaken, first using pepper pots in 1962, then as a practical means of collecting the large quantities of seed required were evolved, broadcast seeding was undertaken, first by hand, then at Heyfield in 1964, aerial seeding, involving agricultural aircraft was trialled (Grose et al. 1968).

Autumn slash burns followed by aerial seeding was soon adopted as the standard regeneration technique and finally introduced on all alpine ash areas. This technique hinged on the large scale collection of seed, and some ingenious methods of extracting the seed from the capsules were derived. At Swifts Creek, a supervisor, Noel Frazer, designed a revolving drum through which hot air was forced. This proved to be a very efficient system.

The need for the slash to be burnt in the autumn after the sawlog harvesting was completed, pushed the extraction of pulpwood with sawlogs as an integrated operation, not as a follow up operation, as had previously been the case.

#### Mountain ash

Mountain ash in this Region usually only occurred in small patches. When well stocked, these areas were treated in the same way as alpine ash, but poorly stocked stands were difficult to regenerate as it was hard to get an effective slash burn due to the dense moist understorey. Coupes with good seedbeds were aerially seeded, otherwise hand seeding or planting was undertaken.

### High elevation mixed species forests

Initially reliance was placed on seed trees but results were generally poor. Some stands regenerated well following slash burning and seeding, but good slash burns were difficult to achieve. Additional site disturbance was trialled and was more successful, but was too expensive to adopt as standard practice. It was difficult to collect the quantities of seed required to broadcast seed on all areas, so planting was also undertaken, but on the small coupes wallaby browsing damage was severe—wallabies preferred the planted seedlings to the natural seedlings. It was not until the 1970s that a significant proportion of these forests were effectively regenerated after harvesting. Considerable research was undertaken into techniques for regenerating this forest type, but up to 1983 no completely reliable economic technique had been devised and adequate stocking was still not being obtained on a number of coupes.

### Shining gum stands

These were limited to the Errinundra Plateau. They were generally well stocked and good slash burns were usually obtained, but the seed was scarce and very expensive to collect, so planting with stock raised from seed from the area was adopted as the standard technique. This proved very successful as there was no wallaby browsing of consequence.

Even though effective techniques were known, the treatments could not always be applied, as the District Forester, David Patterson, pointed out in the Nowa Nowa District 1967-8 Annual Report, remnant trees were still the problem, only 54 hectares of the 1300 hectares logged in that District was cut to a level where regeneration could establish. The funds were inadequate to undertake the cull felling necessary. Other Districts had similar problems though not to this degree.

But gradually more funds became available and by the end of the 1970s the bulk of the stands being harvested were given regeneration treatment, though funds were not sufficient to treat high cost, low yielding coupes. These treatments resulted in a good or at least adequate stocking of regeneration except on a few high elevation mixed species coupes.

# Planning the operations and recording the information

With the Commission staff now planning the harvesting, the stands being fully utilized, and the coupes regenerated, a system for recording all the information, both before the harvest and after the establishment of regeneration was required. In 1964, Rolly Parke, the Divisional Forester in Bairnsdale, pointed to the need

for a uniform system to be adopted. A start was made in the Nowa Nowa District in 1968 with the subdivision of the District into blocks and compartments with a series of maps showing resource information, areas harvested, regeneration works undertaken, and all management details recorded in a block register. Later this system was applied in all the Forest Districts of the Region.

It was realized that resource information provided by current assessments was not adequate for detailed planning so advantage was taken of the techniques which had been developed to use light aircraft to take 35 and 70mm aerial photographs (Spencer 1971), and with training, district staff were able to undertake the photo interpretation and assessment work required. This greatly facilitated planning for harvesting of a particular block and for the first time enabled a clear picture of the progress of utilization in each logging unit to emerge.

This photography was also the key to planning the post-harvest operations. It was first initiated to assist in planning the aerial seeding program in 1965, and by 1975 the bulk of the harvested areas were photographed at the end of each summer. As an indication of the scale of the work, in 1978, in the Orbost District 35 coupes were photographed. When regeneration surveys were implemented on a regular basis in 1970, this information was also recorded. The availability of detailed topographic plans and the ability to transfer the information from the photographs to these plans was an essential adjunct to the success of this work.

In 1980, the Commission officially agreed to a standard system for subdivision of native forests for management purposes and by 1982 the planning of all operations, pre and post-harvest, had become a sophisticated system, with a step by step approach for the supervisor to follow. This involved completion of logging control sheets before cutting commenced, provision of details of planning for harvesting and regeneration treatment, supplying details of the work carried out and filing a coupe completion certificate signed off by the contractor before he left the coupe (Squires and Geary 1982).

# **Environmental impacts of harvesting**

Environmental groups were starting to express concerns about the adverse impact of timber harvesting in the early 1970s, but it was the damning comments in the Fight for the Forests (Routley and Routley 1975) which focussed public attention on the impacts of the large-scale harvesting of pulpwood by Harris Daishowa at Eden. This pushed foresters in East Gippsland to look closely at the impact of harvesting operations in their own areas.

Concerns had been expressed over many years with the impact of timber harvesting on catchment management and water quality. This particularly related to town water supplies. Orbost received its water from the almost completely forested Rocky River Catchment. In consultation with the Soil Conservation Authority, prescriptions regulating harvesting operations were promulgated in 1958. Logging was not permitted within 20 metres of the intake weir and within 10 metres of the inflow stream for 400 metres above the weir. In 1960 these were amended to include a ban on logging in winter or periods of wet weather. Though

even with logging stopped, the water became turbid in wet weather and this was blamed on the logging.

Elsewhere across the region, logging was far from any domestic water storages and there was little public concern with its impact on water quality. Soils in the Region were generally stable and any detrimental impact appeared to be only temporary. But during the 1960s concern was being expressed on the increased turbidity of streams running through logging areas, the major problem being harvesting in wet conditions, and more particularly, during winter. However sawlogs had been found to degrade badly by cracking and splitting if stored over summer, and it was only when it was demonstrated that these logs could be stored without degrade in dumps under water sprays, that sawmillers were prepared to accept wet weather and winter bans on logging.

In 1974 the Eastern Division in association with the Soil Conservation Authority drew up guide lines to reduce erosion and protect water quality (Gidley 1974). Shortly after, the Forests Comission introduced prescriptions covering all State Forest (Forests Commission Victoria 1974). The main requirement was that a 40 metre buffer strip be left along all major rivers and a 20 metre buffer along all streams which run for most of the year. Later buffers were extended to cover all streams with a defined bed and banks. Intermittent streams with defined banks were protected through a ban on snigging in or across them.

With the realisation that there were areas of high erosion hazard, such as the granite soils of Maramingo, and that some highly disturbed sites such as gravel pits and landings, needed rehabilitation, the need to develop stringent, detailed controls became apparent, and a 'Code of Practice' was introduced in East Gippsland in 1979. This covered all operations involving earth moving and soil disturbance. The restrictions imposed on logging contractors were not always readily accepted as evinced by the reported comments of one prominent sawmiller to his contractor: 'keep going the way you are, don't take any notice of those Forestry b...s'.

Of greater concern to the environmental movement in the 1970s was the potentially harmful impact of harvesting operations on wild life. Harry Recher had undertaken studies and came up with recommendations for the Eden operations as to how the adverse impacts could be minimized. (Recher et al. 1980) These involved the leaving of substantial streamside reserves for wildlife habitat, retaining trees with hollows, singly or in groups, and leaving patches of the mature forest. His views were supported by studies done by Forest Commission officers at Boola Boola (Loyn et al. 1980) and the results of the 1975-76 Maramingo and Reedy Creek pulpwood trials (Loyn 1980).

In the Eastern Division these requirements were standardised in 'The Control of Harvesting Operations', an interim set of conditions which applied from January 1981. They were incorporated in the Orbost District Management and Recording System, through requiring the proposals for tree retention to be specified and the trees to be marked, before logging on the coupe could commence. (Squires and Geary 1982) The introduction of these measures did not

satisfy environmentalists, but they did go a long way towards minimizing any adverse environmental impacts from the harvesting operations.

# Managing the next crop

Even when an adequate stocking of regeneration was obtained it did not mean that its future development was assured. By 1960, regrowth was being established following harvesting operations on substantial areas of the coastal and foothill forest, but the development of this regrowth was being severely retarded by the high stocking of remnant trees. When funds became available districts implemented programs to liberate this regrowth, i.e. to kill, these remnant trees, first by ringbarking, then later by poisoning. By 1968, 800 hectares of this work was being undertaken annually. In 1970 the District Forester at Orbost pointed to the dramatic improvement of the growth of the regeneration following this treatment. (Johnstone 1970) With funds provided under unemployment relief schemes in the early 1970s this work expanded to some thousands of hectares annually. But only a small proportion of the area needing this treatment, actually received it. Research in these regrowth stands in the late 1970s quantified the great impact that even a small amount of overwood had on the growth of the new crop, (Incoll 1979) thus justifying investment in this work, but no more funds were provided. However overall across the region the logged stands were well stocked with regeneration, the amount of overwood left on coupes was declining, and most had the potential to yield much higher volumes of timber than was harvested from the original crop.

To ensure a new crop the regrowth must be protected from fire as it is particularly sensitive to fire damage. However it was not practical to provide significant additional protection to that provided to other forest areas. Some logging regrowth suffered damage from the severe wild fires in the late 1970s and early 1980s and in particular, the 1983 Cann River fires. But generally the fire protection was effective, the great bulk of the regrowth stands were not burnt and those which were burnt, recovered to a reasonable degree.

# Pulpwood

This paper is about the management of the sawmill harvesting operations. Sawlogs were not the only timber product of consequence being harvested during this period. Both sleepers and poles were major products, but their management is a separate story which is not dealt with here.

The harvesting or non-harvesting, of pulpwood is discussed because of its close links with sawlog harvesting. The sawlog harvest generated an enormous volume of wood which, though not suitable for conversion into sawn timber, was suitable for wood pulp for paper manufacture. Harvesting of pulpwood in association with sawmilling is normally a standard practice wherever a market for the wood exists. Revenue is increased through the harvesting of large volumes of wood and it can

make economic the logging of marginal stands. It ensures regular, reliable establishment of regeneration while significantly reducing treatment costs.

The resource in East Gippsland was also large enough to support a major pulp and paper industry, with the benefits to the local community which such a major industry could bring. The western part of the Region was within an area which Australian Paper Manufactures had the rights to extract wood, but in practice, this firm only took a tiny fraction of the wood available. There were a number of moves to set up an industry and harvest wood from the eastern part of the Region but these came to nought. In 1981, an Environmental Effects Statement prepared for the Minister of Conservation, found that pulpwood harvesting could bring benefits to the Region (Scott 1981). But pulpwood, which in the west of the Region could be supplied to A.P.M.'s pulp mill at Maryvale, near Morwell, without demur, was never an acceptable product in the east—even to the extent that a proposed operation to salvage pulpwood from stands killed in the 1983 Cann River fires for delivery to Eden was not agreed to.

Far East Gippsland was probably the only place in the world where, while it was acceptable to use one product from a tree—the sawlogs, another product—the pulpwood—was judged to be unacceptable. This was a political decision, reflecting the strong opposition from a vocal environmental lobby. This greatly added to the difficulties and costs of managing the forests in East Gippsland, greatly reduced the potential benefits and deprived the communities of East Gippsland of substantial employment opportunities.

# Condition of the East Gippsland forests in 1983

The field foresters of East Gippsland can be proud of the state of the forests as they were in 1983. They had managed the harvesting of a resource which has been of enormous benefit to the local communities and the people of Victoria. They had replaced very large areas of mature, often damaged forest, showing little, if any growth, with vigorous regrowth. They had developed techniques for managing these forests, first concentrating on the harvesting of the original crop, then on replacing it with regrowth and later, on limiting the adverse environmental impacts of the operations on the forest. They followed research when there was research to follow, they undertook trials in the field, the results of which were not published and in many cases, were not even recorded. But primarily the techniques were developed through the practical field experience of many foresters in different locations throughout the Region. By 1983 they had devised sophisticated systems for ensuring the proper planning and effective control of the harvesting operations and the establishment of the new crop.

These forests were no longer bush but managed forests—though not managed in the neat and tidy way that plantations are. They were scrubby and the regrowth was uneven and interspersed with older trees. Patches or substantial areas of unlogged forest remained throughout. But overall it was a huge, young, growing forest, potentially capable of sustaining a major timber industry in the future. At the same time, these logged and regenerated forests have substantially retained

their environmental values, in particular, as habitat for native wildlife. They certainly have not been destroyed, as was commonly portrayed in the media at the time they were harvested.

In spite of their enormous potential there is no certainty that these forests will continue to be managed for timber production. With the introduction of the Land Conservation Council's process, there has been a fundamental change in the approach to land use so that the original status of Reserved Forest has become irrelevant, indeed there is no longer such a concept. All public land can be subject to ongoing review. Environmental groups are pushing strongly for all logging of native forests to cease, and if they succeed, these logging regrowth areas will not be available for harvesting in the future.

But whether they are used to support a future timber industry or turned into conservation reserves, the foresters have succeeded in their role by providing the future generation with the option.

## Acknowledgement

I would like to thank the staff of the Department of Natural Resources and Environment, Bairnsdale office, for enabling me to check through and make use of the available records.

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I was a field forester in East Gippsland for much of this period and this paper is broadly based on my recollections, reinforced by my field diary and the limited Departmental records available. I cannot claim complete accuracy for the information provided and if I have not given credit where credit is due, I apologise. Departmental sources include:

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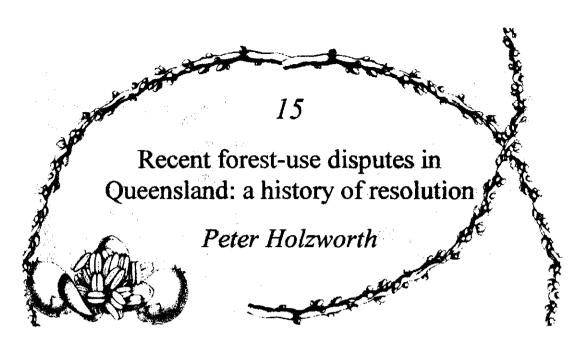
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#### Introduction

In recent decades there have been many disputes over the use of Australia's prime forests from both commercial and preservation viewpoints. Arguments have been highly polarised. Many sections of the community have argued for preservation of pristine old-growth forests with wilderness value, others have pushed their cases for the sustainable use of forest resources to meet the needs of urban expansion and rural development. Others have considered that you can preserve the best and utilise the rest.

Processes towards resolution of these disputes have taken many forms such as public participation in management plan preparation, compilation of Environmental Impact Statements, government appointed inquiries, independent mediation and negotiation, and the final solution in some cases, political intervention. Varying levels of success have been achieved.

There have been four major disputes over the use and management of forests within State-owned land in Queensland since the 1970s. Forests under dispute have been those of the Wet Tropics (north Queensland), Fraser Island, the Conondales and latterly, biogeographic regions of the State.

This paper does *not* attempt to argue the merits of any of the protagonists' cases involved in the land-use debates. Rather, it looks at the ways in which the debates on land-use disputes were argued and finalised. The first part of the paper outlines the facts surrounding each of the four disputes and their resolution. The second part discusses the contrasts between the cases and the processes of resolution and it discusses any evolutionary changes that are apparent, such as those related to political intervention and public involvement.

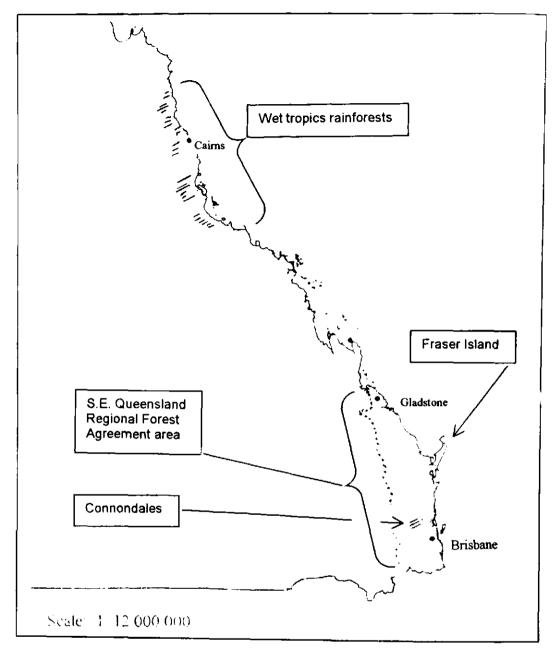


Figure 1: Four areas of forest disputes in Queensland

# Four forest-use disputes

## Wet tropics

There is no doubting the beauty and biological richness of the tropical rainforests of north Queensland. They stretch from Townsville to Cooktown in a discontinuous belt of some 450 kilometres in length and occur on many land forms from undulating uplands and mountain peaks to coastal lowlands. Certain localities within the rainforests exhibit very high biological diversity and support rare species of considerable significance.

Because of their value to developers, commercial users (timber and mining industries, for example) and, in recent decades, preservationists, the rainforests of north Queensland have had a history of land-use conflict this century, including a Royal Commission on the Development of North Queensland (Land Settlement and Forestry) in 1931.

In the early 1960s, 'the finding of the North Queensland Land Classification Committee reflected both a greater community recognition of the value of the rainforest resource and their (sic) increasingly residual nature' (Cassells et al. 1986). In the mid 1970s, public pressure increased for the complete preservation of the remaining areas of tropical rainforest in north Queensland.

The public debate escalated during the next fifteen years and after much acrimonious discussion among Queensland Forestry Department officials, timber industry spokesmen and members of the environment or 'green' movement, together with 'sit ins' and massive media coverage, Prime Minister Hawke on 5 June 1987 announced that his government would move to nominate the Wet Tropics of north-east Queensland for World Heritage listing. This move posed a constitutional conundrum. Under the Queensland Constitutional Act, the State owns all land and its attendant resources within its boundaries and it may decide how that land and those resources may be managed or disposed. At federation, the States ceded the power to enter into treaties to the Commonwealth Government of Australia. There are some doubts that the founding fathers intended environmental agreements, especially those made against the wishes of the States, to be included under the definition of 'treaties' (Tadman, pers. comm. 1998).

Later that year, on 20 August 1987, the then Minister for the Environment and the Arts, Senator Graham Richardson, announced the indicative boundary for the proposed World Heritage nomination. He also launched a public consultation process to obtain the views of parties with interests in the region. After the consultation ended, the Federal Government announced on 11 December that nomination would proceed and it released the boundary for the region.

In January 1988, 'the Federal Government introduced regulations banning logging under an external treaty and supporting legislation which it had passed in 1983. All this was done without involving the Queensland State Government' (Taylor 1994). The use of these federal powers virtually hamstrung the Queensland Government. But this was not the end of the matter. Boundary definition was one thing, but how to manage the area within that boundary was another, given that the State had responsibility for management and the Commonwealth Government's World Heritage Properties Conservation Act merely empowered the relevant minister to put a stop to certain activities. The battle between the Federal Labor Government and the State Coalition Government began in earnest at top level. At a local level, bitter argument continued amongst representatives of local government, forestry, industry and the 'greens'.

Nearly twelve months after Hawke's announcement, a discussion paper entitled 'Wet Tropical Rainforests of North-East Australia' was prepared by the Federal Government's Department of the Arts, Sport, Environment, Tourism and Territories (DASETT) and released nation-wide for comment from April to July 1988.

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Later that year, in September, the same Department issued a report to the World Heritage Committee Secretariat in which it stated that:

The Federal Government has made interim arrangements to ensure full protection of the World Heritage values of the nominated area through the application of Federal laws and resources pending the finalisation of cooperative management arrangements with the State Government. The Federal Government will implement unilateral long-term management arrangements consistent with its legal powers and obligations under the World Heritage Convention only in the event that it is not possible to establish co-operative arrangements with the State Government (DASETT 1988).

In the same report the Federal Government stated that the 'basis of the Queensland position remained that a viable timber industry had to be maintained in the region'. The report also recognised that considerable negotiations had taken place between the Queensland and Federal Governments as well as talks by the Federal Government with individuals, organisations and local government councils from north Queensland.

After several meetings between officers of both the State and Federal Governments from June 1998, the Queensland Government responded with a submission to the World Heritage Committee in in December. It was called 'The World Heritage Convention: A Turning Point' in response to the report from the Commonwealth Department of Environment. The main thrust of the State document was a request that the World Heritage Committee defer consideration of the nomination of the Wet Tropics of Queensland because:

The proper identification of areas which are 'cultural heritage' and 'natural heritage' in relation to the present nomination is a matter of internal dispute within Australia.

The Federal Australian Government cannot guarantee future management or control of the nominated area.

The Federal Australian Government has not complied with the recommendations of either the IUCN (International Union for the Conservation of Nature and Natural Resources) Review Committee or the World Heritage Bureau.

Unless the World Heritage Committee defers the nomination, there is a grave risk that both within Australia and internationally, the World Heritage Convention and the principles underlying its original adoption could be placed at risk.

Furthermore, the document stated that not all of the nominated area was of sufficient outstanding universal value to satisfy criteria under Articles 1 and 2 of the Convention and that it was not necessary and/or desirable, even if the area was included on the World Heritage list, to exclude all aspects of sustainable development and in particular, timber harvesting. Basically the Queensland position at this stage was to retain a timber industry as a bulwark against unemployment and social and economic upheaval should World Heritage listing eventuate. It was also an appropriate time to press the argument that sustainable

forestry with its long tradition of serving the public of Queensland be seen as the only scientific and proper way of managing the forests of the State (Media Paper 1988).

During this period, the Queensland Government, under Premier Ahern, launched two challenges on constitutional grounds-which were later defeated in the High Court—and began a challenge on scientific grounds also to be heard in the High Court. The latter challenge questioned the scientific credibility of the World Heritage values of large areas within the nominated area, as they related to the above mentioned Articles 1 and 2, and sought to demonstrate that poly-cyclic selection logging of some 13.4 per cent of the total area would not affect the World Heritage values for which the area had been listed (Tadman, pers. comm. 1998). This action set a precedent of its type in an Australian court. The stakes had escalated and the State Government was pursuing the matter at the highest judicial level in the land. Queensland also prepared to challenge any proclamations and regulations that might hinder commercial forestry operations in the nominated Wet Tropics forests, claiming that 'its [Queensland Forestry's] selection harvesting programme on the 13.4 per cent of the rainforest areas within the nominated area will not affect the World Heritage values that are contained in the nominated area' (Media Paper 1988).

In March 1989, the Queensland Government approved a 'Strategic Plan to Manage the Wet Tropical Forests of North East Queensland'. This was an attempt to convince the Federal Government that Queensland was sincere in its concern for the proper management of the northern tropical forests. One key component of the plan was the introduction of land-use zones, a system that was 'in line with recognised world conservation strategies and provides for a range of options from preservation to carefully controlled development' (Queensland Government 1989). For each of these zones, management prescriptions would be written and any issues concerning land-use priorities and difficulties associated with them would be taken into account.

It was hoped to implement the Strategic Plan early in 1990 and to set up a Wet Tropical Forests Planning Unit within the existing Northern Rainforest Management Agency to 'co-ordinate research and planning activities within the Planning Area and carry out all reviews'. The Strategic Plan was the forerunner of a detailed Management Plan to be compiled at a later date. In fact, the Strategic Plan was both a blueprint for writing the Management Plan proper and a model for setting up the Planning Unit.

The Federal Government was not persuaded!

Matters came to a head in December 1989 when Premier Ahern's conservative government in Queensland was swept from office by Labor's Wayne Goss. Now Canberra was politically aligned with Brisbane. A Federal Labor government and a Queensland Labor government were in concert and the decision on land-use of the Wet Tropics forests was entirely political. The decision of the Hawke government on June 5 1987, some two and a half years earlier was to become a reality now that Labor in Canberra had the full support of Labor in Queensland. The High Court challenge by Queensland was dropped along with the Strategic

Plan proposals. The outcomes of the political decision were: the conversion of some State Forests to National Parks, the establishment of a Wet Tropics Management Council and a Wet Tropics Management Authority, an annual loss to the north Queensland timber industry of 60,000 cubic metres of structural and cabinet wood sawlogs, the jobs and lives of 500 people affected, and compensation of \$75 million offered to prevent direct and indirect unemployment (Taylor 1994).

#### Fraser Island

Fraser Island, the largest sand island in the world (166,000 ha), lies east of Hervey Bay in south-east Queensland and is separated from the mainland by the Great Sandy Strait. It is part of the Great Sandy Region. The Island is about 120 kilometres long by 20 kilometres wide and is one of the most beautiful natural places in Australia, containing magnificent forests of satinay (Syncarpia hillii). blackbutt (Eucalyptus pilularis) and brush box (Lophostemon confertus), blue and brown fresh water lakes and long stretches of fine beach. The island is comprised almost entirely of sand dunes. At the time of its two land-use disputes, some two-thirds of the Island was under State Forest tenure, the rest largely under National Park tenure, with some pockets of private land mostly in small townships. Logging, tourism and sandmining were the main sources of local income. This spectacular island has a long history of utilisation of its resources. The first logging dates to 1869 and has continued until nearly the last decade of this century. Sporadic settlement, fishing, logging, tourism, the setting up of missions for Aborigines and sandmining are activities associated with Fraser Island's relatively long history.

The first large scale public disquiet about development occurred with the granting of sandmining leases in 1950 and 1966, the latter prompting the formation of the Maryborough branch of the Wildlife Preservation Society (1967) and the Fraser Island Defenders Organisation (January 1971). In 1971 the Oueensland Government released a Fraser Island land-use report which gave impetus to sandmining but after much controversy and a Commonwealth inquiry, mining ceased on Fraser Island on 1 January 1977. More attention to land-use on the island became evident between 1971 and 1990 when the State Government created and extended National Park areas. In 1978, a management plan for the island was drafted by an inter-departmental committee. This was followed by a recreation areas management plan approved by the Fraser Island Recreation Board. In short, Fraser Island was now very much in the public eye in terms of: previous sandmining; increasing recreation (and its attendant visitor problems); and Commonwealth and State government involvement in decision-making. Joint responsibilities were outlined for recreation management by the Queensland Forest Service and the Queensland National Parks and Wildlife Service under the auspices of the Recreation Board. But the next stage of controversy and bitter confrontation was yet to come and this time it was the old issue that was still being fought in north Queensland: forest management and logging in State Forests versus preservation under National Park tenure with World Heritage status.

By the late 1980s the argument for protecting old-growth forests had well and truly entered the debate. It was centred on the tall, unlogged, moist forests in the coastal areas of south-east Queensland and especially those of Fraser Island. Wilderness value, consistent with large parcels of old-growth was an additional issue.

In 1989, the key players in the Fraser Island debate were beginning to form battle plans. At this stage the Coalition Government was still in office in Queensland and Labor still held the reins in Canberra under Prime Minister Hawke. The Labor Party then came into power in Queensland in December 1989 ousting the long-standing conservative government. While the north Queensland Wet Tropics drama was soon to come to an end in a swift and irrevocable political solution, the conflict on Fraser Island was only beginning. Part of the State Labor Party's pre-election environmental platform was the promise of an inquiry into the conservation and management of Fraser Island. On 26 February 1990, Premier Goss announced a Commission of Inquiry into the Conservation, Management and Use of Fraser Island and the Great Sandy Region, and appointed Mr Tony Fitzgerald to head it. The terms of reference were to inquire, report and make recommendations to the Premier on behalf of the Queensland Government with respect to the following matters:

as a matter of priority, the conservation, management and use of Fraser Island in the public interest with due regard for environmental, recreational, cultural, social, economic, industrial and any other material considerations and the interests of potentially affected individuals;

the conservation, management and use of the Great Sandy Region in the public interest with due regard for environmental, recreational, cultural, social, economic, industrial and any other material considerations and the interests of potentially affected individuals;

the establishment of principles, systems and procedures for the orderly development and implementation of policies and the resolution of issues or disputes concerning areas of Queensland in relation to which particular regulation or control may be needed for environmental, cultural or other special reasons;

any legislation or other action by the Government of the State of Queensland necessary or appropriate to implement or give effect to such recommendations.

In regard to the third term of reference a Dispute Resolution Unit of the Fitzgerald Inquiry was set up and led by a barrister. The Unit was active for nine weeks, with representatives invited from all Queensland Government departments interested in environmental matters. Documentation prepared as a result of this process was considered by Commissioner Fitzgerald in formulating his final recommendations on Fraser Island and the Great Sandy Region (Tadman, pers. comm. 1998).

On 20 May 1990, the Queensland Parliament approved a resolution to increase the size of the Great Sandy National Park (including Fraser Island) by 19,700 hectares. The action was consistent with pre-election promises but no doubt

signalled to many that this was the foot in the door in regard to reducing the area of State Forest and by inference, the reduction of logging in the region. Included in the increased area referred to by Parliament was a large unlogged block of satinay forest and rainforest, now popularly referred to as old-growth.

Some 544 submissions were made to the Commission from a wide range of organisations and individuals. Such reports and submissions were made available to the public and to a panel assisting the Commissioner and claims and counter claims as to the veracity of these public documents were frequently made.

The Commission's Report was brought down in May 1991 and recommended, *inter alia*, that:

Fraser Island and nominated surrounding areas be nominated for World Heritage listing.

Administration of the area be carried out by the director of an advisory board under the direction of the Minister for the Environment and Heritage.

A management plan be prepared to provide policy and procedures in regard to the management of the region.

Logging to continue to be prohibited in old-growth forests but could continue only on previously logged blackbutt forest provided it was feasible and ecologically sustainable according to the Director of the Department of Environment and Heritage and provided that such logging be reviewed after a period of at least five years.

All State Forests in the region to be revoked except to the extent necessary for logging as per the Report's recommendations.

This was not the end of the matter of course. The State Government had yet to make its decisions on the Report. Nevertheless in the interim it was reported that the Police Commissioner of Queensland was expected to oversee a protest operation on Fraser Island designed to cope with up to 2000 protesters. Headlines in the newspapers 'shouted' the usual rhetoric from zealots on all sides of the argument. And as expected there were numerous demonstrations on the Island itself.

Acceptance of Fitzgerald's recommendations meant that the restrictions on logging were such as to make the harvesting and processing of blackbutt (already only one third of the timber cut on the Island) uneconomic and on 30 July 1991 the Primary Industries Minister was reported as saying that 'all logging on Fraser Island will end this year with a multi-million dollar compensation package for timber workers'. In September 1991, Premier Goss announced a \$38 million compensation package to those disadvantaged—including the timber workers and sawmillers—by the closure of logging and the disruption of other industries and services. The effects on the timber industry were the loss of 23,500 cubic metres per year of quality timber and, more importantly, the livelihood of 500 people and the productivity of two large sawmilling companies.

Logging ceased on 31 December 1991. Fraser Island is now World Heritage listed.

#### The Conondales

As the 1991 brochure on future land-use for the Conondales outlines:

The Conondale Range is 100 km north-west of Brisbane in the Sunshine Coast hinterland. Set amongst rolling farmland and within easy reach of the growing population of south-east Queensland, the area is well known for its scenic qualities, its diversity of forest types, and significant fauna and valuable timber resources. Public interest in the conservation values of the Conondale Range had previously led to the establishment of two national parks in the area. More recently, concern about the adequacy of conservation reserves had led to a commitment by the state government to increase the size of the Conondale Range National Park.

The Land-use Study of the Conondale Range—some 29,000 hectares in area—arose from a pre-election commitment of the Goss Labor Government (1989-96) to examine the adequacy of Queensland's National Park reservation system and coverage. In regard to the Conondale Range area, the Goss Government stated that 'Sections of the Conondale Range...in the hinterland of the Sunshine Coast will be gazetted as national parks' (Conondale Range Consultative Committee 1991).

In this case the broad directive to increase the size of the National Parks in the Conondales had been given by the government at the outset. The task therefore was to decide what additional areas would become National Park and to advise the government accordingly. Herein lay the potential for dispute over the right to use areas for timber and other developments (primarily mining, bee-keeping and grazing) within the highland forests versus the right to set aside areas of high environmental value within National Park tenure. Two terms of reference were drawn up by government officers:

To examine the adequacy of areas within the Conondale study area managed primarily or exclusively for conservation purposes and, through a process of community consultation, recommend additional areas based on sound scientific and land-use principles.

To make recommendations on existing management practices which are of concern within the State Forest and National Park estate of the Conondales.

Two government authorities jointly managed the decision-making process in a cooperative arrangement with key stakeholders. The two authorities were the Queensland Forest Service and the Queensland National Parks and Wildlife Service. Major external stakeholders were invited to participate in the planning process, namely representatives of the conservation movement (regional groups and the Queensland Conservation Council) and the timber industry (local and interstate sawmilling firms and the Queensland Timber Board).

In the latter part of 1990, both government authorities and the external stakeholders formed the Conondale Range Consultative Committee to lead the discussion and guide progress towards mutually satisfactory land-use decisions. A Zoning Working Group was also convened to collect and consider Conondale land-use data, to analyse public comment on a draft land-use proposal and

throughout the process, to advise the Committee on the Group's deliberations. It was made up of members of the same factions as the Consultative Committee, and in fact some members served on both the Committee and the Group.

The Zoning Working Group, deliberating from July to September 1991, provided the Consultative Committee with best agreed land-use options. This was not an easy or agreeable process in some instances, because of the differing opinions and long-held values in the Group. Aware at the outset of the possibility of breakdown of talks, and conscious of the overwhelming desire of all participants to get a credible and long-lasting solution to the Conondale problem, facilitators from the Community Justice Program of the Attorney-General's Department were made available on request. The facilitators ensured all Group members had a fair say and that all data from individuals was discussed and either accepted, modified or rejected by the Group as a whole. The facilitators were a most important element in the resolution of conflict among those who had not encountered this form of debate before and who were, in recent terms at least, traditional enemies, such had been the polarisation of views from several years of forest-use confrontations.

Public participation was not confined to members of both the Committee and the Group. From 4 September 1991 to 31 October 1991 a broader public participation process took place following the release of the initial Consultative Committee's recommendation by State Labor Ministers Casey (Department of Primary Industries) and Comben (Department of Environment and Heritage). Brochures were published and public information displays were set up during tours of towns in the Conondale region. A display was also staged in Brisbane. A one month period for public response was set after completion of the tours.

Among the major outcomes were recommendations to increase the area of National Parks in the Conondales (not surprising considering the charter handed down by the government) and to adopt a range of other measures to ensure environmental protection of areas requiring special management. Some timber production areas were taken from forestry management and the timber industry, certainly enough to damage the industry but arguably not enough to have a major negative impact on it. In any case, no compensation was offered to the timber industry by the State Government. The exercise was a mutually-agreed low-key affair with no media involvement. The outcomes were accepted by all stakeholders and the community.

## **Regional Forest Agreements**

By the early 1990s, the international and Australian debate about global and local environmental issues and the public management of forests had been in the community consciousness for decades. In 1992 Australia endorsed and signed the Global Statement of Principles on Forests at the United Nations Conference on the Environment and Development in Rio de Janiero. It was a major turning point in the attitudes of Australian decision-makers to the future management and use of the forests of the nation. The outcome was the National Forest Policy Statement, developed through the Australian Forestry Council and the Australian and New Zealand Environment and Conservation Council in consultation with other

relevant agencies. It was signed by the Commonwealth, State and Territory Governments except initially Tasmania, which had 'affirmed its commitment to the management of its forest resources as set out in the Tasmanian Forests and Forest Industry Strategy in December 1992' (Commonwealth 1992).

Among the Statement's many policies in relation to forest conservation and its impact on wood production and industry development on Crown lands were two directives. The first was 'ensuring that a comprehensive, adequate and representative reserve system of old-growth forests and wilderness areas are in place by a defined date'. With unbelievable optimism this was originally set at 1995. The second was 'further developing and applying codes of practice for all commercial and high impact use forests'. It was agreed that following comprehensive forest assessments, the Commonwealth would consider waiving the necessity for export licences from regions covered by agreements. Queensland was obliged to carry out the assessments but not for export licences as it did not export native log timber.

The Queensland Government's response in September 1993—essentially in terms of sustainable timber production on native forests—was to produce a complementary policy called Greater Planning Certainty for Queensland's Wood Products Industry Based on Crown Native Forests. It was developed in consultation with the timber industry and conservation groups. It stated:

The greater planning certainty policy should be read in light of the Government's commitment to the National Forest Policy Statement. It is not intended to diminish the State Government's responsibilities under the National Forest Policy Statement and other national agreements and strategies to which the Queensland Government is a signatory. Rather, it provides a mechanism for implementing these existing Governments' commitments (Oueensland 1993).

The policy espoused in the document in relation to native forests contained three elements: a comprehensive regional assessment and planning process; a process for the development and monitoring of ecologically sustainable forest management; and mechanisms, including (for particular areas) contractually-binding wood supply agreements that would provide the wood products industry with increased certainty of access to native forest wood supplies from State Forests, Timber Reserves and Crown leasehold lands. It was essentially aimed at resource security for the timber industry within an environmental framework.

Embedded within the Queensland policy—and in alignment with the national forest policy—was a commitment to 'delineate major large areas containing old-growth and/or forested wilderness that are likely to have high conservation value' and to 'identify forested areas known to contain endangered species and/or communities, and important cultural or other values'. This process was called Interim Management Arrangements and the identified areas called Interim Management Areas. The latter were to be subject to either logging exclusion or to modified logging conditions in the interim, that is until the comprehensive regional assessment of Queensland was completed. Outside the Interim areas, logging and

other legitimate activities on Forestry land could continue, subject of course to the usual conditions of forest operations.

In this particular case study, the rules had been set by joint State and Federal Governments. There would be a process of land-use assessment in regard to government owned forests throughout the nation (not including Tasmania initially) to ascertain the best use of the lands so assessed, and there would be tighter controls on logging and forest management practices. Outcomes from the process would be promoted for voluntary adoption on private lands.

Decisions on best land-use led to disputes of course but they were not at the political level, rather they were at both inter-governmental level between the state and federal bureaucrats and between government bodies and non-governmental organisations such as the timber industry, Indigenous and conservation groups. The disputes were low-key affairs and centred mainly on locations of land boundaries (what should be logged versus what should be preserved) and the extent of restrictions that should be placed on forest management activities, especially logging.

One other important element in the overall Federal/State policy was the upgrading of State environmental safeguards in relation to managing the forests. These safeguards were to be scientific and were to include stringent measures such as logging guidelines, codes of practice, management plans, logger accreditation systems or the implementation of international standards of practice in regard to working the forests.

The main outcome of the process to date in Queensland is the imminent (April 1999) consideration of land-use options for the south-east Queensland zone.

## Analysis of resolution processes

This part of the paper looks at a number of elements—including the history of land-use conflict, the degree of political intervention and/or democratisation, and community involvement—within the resolution processes, and charts some of their changing patterns. A summary is provided in Table 1.

## History of land-use conflicts

The longest period of unrest and debate over the use of Queensland's native forests in the four cases outlined above was certainly that of north Queensland. In the 1970s, coincident with the rise of the conservation movement in many western countries and Australia, public pressure began to bear upon the activities of the then Department of Forestry and the timber industry in north Queensland. Unlike the 1930s squabble over rainforest land for settlement, dairying and development on the one hand and the retention of rainforest for timber production in perpetuity on the other, the argument this time centred solely on ousting the timber industry from the forests and preserving remaining areas of rainforest for posterity. World Heritage listing was the ultimate goal of those committed to preservation.

By contrast, the Fraser Island forest conflict began more recently than the debates in north Queensland and did not last as long. The earlier controversies

were over sandmining, not logging of the island's forests, at least initially. The sandmining issue began with the granting of leases in 1950 and later in 1966, the latter resulting in the formation of the Fraser Island Defenders Organisation to fight the sandmining of the eastern coastal dunes. Only later did that organisation and other groups and individuals turn their attention to preventing the logging of the Fraser Island forests, particularly the old-growth satinay forests in the central to northern areas, claiming them as rainforest, erroneously so according to botanists and foresters. There was also objection to logging of the blackbutt forests growing in adjacent areas, the objectors pointing to the so-called long-term damage done as the result of logging and subsequent burning of forest pockets for regeneration. As in the north Queensland case, the cessation of logging on Fraser Island and the creation of more National Park areas was central to the early argument against the Queensland Forest Service (as the Department of Forestry had then become) and the timber industry. The argument was to escalate into a cry for World Heritage listing.

The history of the Conondales unrest was even more recent and the solution more quickly found. Since the gazettal of National Park 1100—an area in the centre of the study area—several proposals were made by local conservationists and other interested bodies for an expansion of the area of National Park in the Conondales. The principal argument put forward was to increase the National Park area by adding existing State Forest land to the two gazetted National Parks (NP 1100 and NP 477) and declaring the entire area a new National Park. The Department of Forestry argued against the proposal claiming that the intervening area of State Forest between the two National Parks should remain as production forest

Instead of primary claims to protect old-growth forest as on Fraser Island, the conservation movement's principal arguments in the Conondales were those of conserving key vegetation communities and the habitats of endangered faunal species, chiefly the marbled frogmouth (*Podagus ocellatus*) and to a lesser extent, the eastern bristlebird (*Dasyornis brachypterus*). A major reason for this was the fact that there was little old-growth forest remaining in the region as the relatively small area had already been logged several times. The catalyst that triggered the dispute was largely based on local lobbying—as was the case with the Wet Tropics and Fraser Island—but the background to the Conondales was much more local, on a smaller scale and conceived on a much more recent time scale than the other two. Like the Wet Tropics debate it was almost entirely centred on anti-logging and increased preservation. It did not have the additional argument of mining (apart from a slight reference to the Agricola gold mine) that made up the background of the early Fraser Island controversy.

The most recent history of all the four case studies has been that of the Regional Forest Agreement process which is still ongoing in 1999. Its history began in December 1992 with the signing of the National Forest Policy Statement by the Prime Minister of Australia and State Premiers. For the first time in Australia's history there was an agreed joint Federal/State policy on forest management and conservation. This was partly due to a desire to see an end to

### Managing

decades of land-use wrangling and bitterness throughout the nation and partly due to a willingness to participate in a new international forum to do the right thing by the forest environments of Australia.

Table 1: Summary of process, decision and outcomes of four cases

Case and process	Decision	Outcomes
Wet Tropics		
National focus Polarised views Demonstrations State/C'wealth driven Media beat-up Massive data collection Minor community input	Federal and State political intervention	Major non-commercial gain. Major commercial loss. Compensation. Anger and division in community Costly. Time-consuming World Heritage listing
Fraser Island		
National focus Polarised views Demonstrations State driven Media beat-up Commission of Inquiry with independent Chair Democratic process Major community input Massive data collection	Government accepts recommendations of the Commission	Major non-commercial gain. Commercial loss bu some provisos. Compensation Acceptance/resignation in the community Costly. Time-consuming World Heritage listing
Conondales	TOTAL STATE OF THE	
Regional focus Govt. sets objective Committee of government, industry and environment No media Community consulted Large data collection	Government accepts recommendations of the Consultative Committee	Balanced land allocation Stakeholder and community acceptance No compensation Time-consuming Seen as a good dispute resolution model
Regional Forest Agreements	The second section of the second seco	
All forests in State State/C'wealth driven Community input No media Massive data collection Long lasting project Multi-tenure coverage	Government accepts decisions of working groups	First Queensland agreement signed in 1999

#### Role of government and political intervention

There has been a decreasing level of direct political intervention employed to resolve forest-use disputes over the period under discussion in this paper. That is not to say that governments have abrogated their responsibilities in the mitigation of the disputes, rather have they increasingly made use of more conciliatory and democratic methods such as inquiries, working groups, the call for more public involvement in decision-making, and the linking of state and federal planning mechanisms to international conventions.

The dispute in north Queensland over the Wet Tropics was resolved, after considerable initial differences of opinion between the State and Federal Governments, through sheer political might and decree once both governments were of the same political persuasion. The decision was then speedily made with no further consultation at any level. Although this was, and is, a legitimate role of governments, the outcomes were not as readily accepted by sections of the community as they were in the other cases outlined, if post-decision reports in newspapers are any guide. Prior to Labor's coming to power in Queensland, there was much annoyance and frustration in the State conservative government at the high-handed manner of the Hawke Government's use of its constitutional 'foreign affairs' powers to ride roughshod over the Queensland Government in declaring World Heritage boundaries for nomination. This feeling was reinforced when the combined Labor governments steamrolled the key State players and the general community a few years later to provide the ultimate political solution to the Wet Tropics dispute. It is somewhat ironic that the deep social divisions arising from this aggressive approach had much to do with the wording of the Inter-governmental Agreement on the Environment signed by the States and the Federal Government in February 1992.

Perhaps the State Government also learnt a further lesson from the Wet Tropics debacle in placing a decision-making buffer between it and the electorate in the form of a Commission of Inquiry into the Conservation, Management and Use of Fraser Island and the Great Sandy Region. Some argued at the time that the State Government's setting up of a Commission was merely a step towards paying back the conservationists who had just helped vote the Queensland Labor Party into office. Others thought that the outcome of the Commission itself was further proof of political payback (Taylor 1994). Nevertheless, the establishment of the Commission was a major step taken by the State Government to allow the people of Queensland a proper and open avenue to provide input to the process and thus have a say in formulating a decision on managing Fraser Island and the Great Sandy Region. In this case too, the process was set up by the State Government as a result of its getting into power and honouring its pre-election promise. Input from the Federal Government was considerably low-key and basically limited to providing information to the Commission.

The land-use study of the Conondales was entirely set up by the Goss Labor Government, once again arising from a pre-election promise, this one to consider the adequacy of the State's National Park reservation system and coverage. In this case the ground rules were set by the State Government, which then took a

back seat and left the decision-making in the hands of government officers working in conjunction with representatives of the timber industry and the conservation movement. There was no sudden and heavy-handed intervention in the process as occurred in the Wet Tropics situation, nor was there appointed an independent commissioner to make recommendations to the Government as was the case with Fraser Island and the Great Sandy Region Commission of Inquiry. In fact there was little politicking at all in the Conondale Range dispute resolution process, primarily because the political decision to expand the area of National Park in the Conondales had already been made. It was left to others to make the secondary decision on what areas were to be included in the expanded National Park estate.

As both the Federal Government and the State Government were heavily involved in the Wet Tropics decision-making process, so too were both involved—along with other State and Territory governments—in the compilation of the new National Forest Policy Statement. However, unlike the Wet Tropics style of decision-making, the call for Regional Forest Agreements and a host of ancillary planning strategies, was based on international principles of forest management and use agreed to by both conservative and Labor governments in the Commonwealth, States and Territories. There was now an agreed model for managing the nation's forests to reduce the possibility of arbitrary decision-making in regard to their use. The guidelines had been set by cooperative efforts of governments and it was now left to government bureaucracies, key stakeholders and interested members of the public to build on the strategies outlined in the Statement and get on with the job of preparing Regional Forest Agreements.

The role of both Federal and State Governments in Queensland's forest use dispute resolution had gone from hasty intervention and unplanned decision-making towards more informed, conciliatory and well-planned methods of resolving conflict in regard to the management and use of the State's native forests.

## Community involvement

There are strong correlations between decreasing intervention of government involvement in the processes of conflict resolution in the last twenty years or so and increasing levels of community participation.

The Wet Tropics debate was generally a stand-off situation between angry and often ill-informed participants on both sides of the development/preservation debate. There was not a great breadth of scientific data available in the early stages of the confrontation compared to that available later in the process and compared to that garnered for subsequent land-use disputes in other parts of the State. Many of the Wet Tropics arguments were fuelled more by emotional rhetoric than logic and reason (this could be said of most forest-use disputes in Australia in the early days of confrontation). Without a lot of credible data to support informed debate the issue of the future of the Wet Tropics polarised quickly and vehemently into an ugly 'no holds barred' contest. It was a media bonanza and the arguments were largely fought there, not in major group discussions between warring sides either in government or in the community. In the

early stages, few data were collected. Only when the High Court challenge was under way did the data collection begin to grow and grow rapidly, at least on the side of government. It has been said that truth is the first casualty of war. In the case of the Wet Tropics confrontation (for that was what it was most of the time) the use of good data was the first casualty; truth perhaps a close second.

The collection and discussion of a relatively vast array of information was always going to be the norm for the Fraser Island issue once the Commission of Inquiry was set up. As previously mentioned, some 554 submissions were received by the Commission's secretariat and the public had considerable time to have its say on the affair. All submissions were open to public scrutiny and all submissions could be challenged in writing—and most were. The Inquiry was completely open and transparent and community involvement could hardly have been higher. This was a far cry from the level of community input in the Wet Tropics debate.

Once again, this time in the Conondales debate, all data pertinent to the decision-making process were made available. In processing this collected information there was no independent arbiter such as Commissioner Fitzgerald in the Fraser Island Inquiry. The information in the Conondales case was scrutinised and considered by key public stakeholders, the government and the general public itself. This was community and government involvement at the closest possible level of decision-making. True, independent mediators assisted in the data collection and discussions but at no time did they have any say in making decisions. That was entirely the prerogative of the government and representatives of the community. The Minister for Primary Industries was moved to commend the Conondales' process as a model for resolution of other and similar debates over forest management and use.

Although the Regional Forest Agreement process is still ongoing it is also very open and transparent and there is no obvious lack of community consultation. Because of the extensive nature of the data collection and the wider range of people likely to be affected by the eventual outcomes the task is enormously resource-hungry and time-consuming. These are just two of the major weaknesses of such a huge enterprise.

#### Conclusion

Although the four major land-use disputes involving forest management and use in Queensland over the last two decades have had varying backgrounds, differing processes of dispute resolution and to a certain extent, outcomes, there have been many points of similarity and more interestingly the processes themselves, when considered chronologically, have a distinct evolutionary nature to them.

The change has manifested itself primarily in an increased political will to listen to the people and to act accordingly, initially at arms length but later with some trust and a sense of ease. Gone for the moment are the shouting and ranting of all protagonists and the coverage of their more colourful antics and activities via voracious media outlets.

Gone too, or at least held in abeyance is the lack of belief in government circles that representatives of alternative persuasion (in regard to looking after the forest estates of Queensland, particularly the public estates) can sit at the table and discuss their positions in a vigorous yet reasonably dispassionate and rational manner than has previously occurred.

In short, there has been a two-way transition in the resolution of debate on public forests. One is the willingness of government to let the public play a significant part in those resolutions and the other is the acceptance (as a right) of the public to participate fully and intelligently towards sound and lasting solutions.

There will be many more confrontations over forests in this State and elsewhere, but it may be that their resolutions will be increasingly based on sound democratic argument and more rational decision-making than has previously occurred.

## Acknowledgment

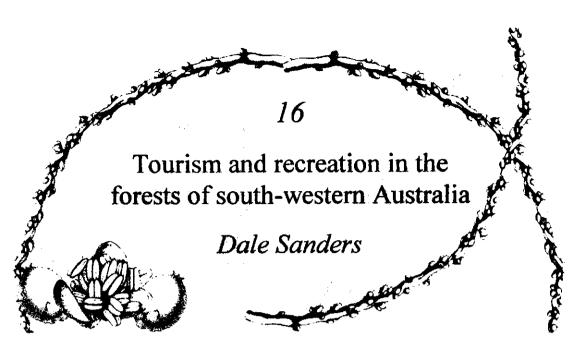
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## Introduction

Forest tourism and recreation in Western Australia, as in the rest of the continent, has an extensive and diverse history about which little is known due to a paucity of research. This paper provides a chronology of tourism and recreation in the forests of the south-west of Western Australia and investigates current tourism and recreation policy issues following the signing of a Regional Forest Agreement in 1999. It focuses on a case study area of the Leeuwin-Naturaliste region, which is the fastest growing region outside metropolitan Perth. It was first suggested at the turn of the century by the then Chief Inspector of Lands, Erskine May, that the forests of Margaret River could provide a sanatorium fostering health and recreation, 'to the Goldfields especially, the Margaret River should be the Blue Mountains of NSW, the Derwent of Tasmania or the lakes of New Zealand when they are taking a holiday' (Western Australian Year Book 1901). This view was reaffirmed in 1902 by the surveyor Harold Johnstone who recommended that the area be retained as a state park, rather than as a state forest, 'to enable those who I believe at no distant date will largely utilise this portion of the state as a health resort to see a patch of our forest in its virgin state' (cited in Creswell 1988: 333).

However, there were a number of obstacles to be overcome before forest tourism could become firmly established in the area and in the wider south-west region. First, there was a need for population growth, and increased access. Second, there needed to be significant infrastructure development, better transport links and increased car ownership. Finally, there also had to be a change in perceptions by both users and managers. Western Australia was still a young State mostly concerned with survival until the turn of the century, and it was not until after World War II that tourism was regarded as a significant industry.

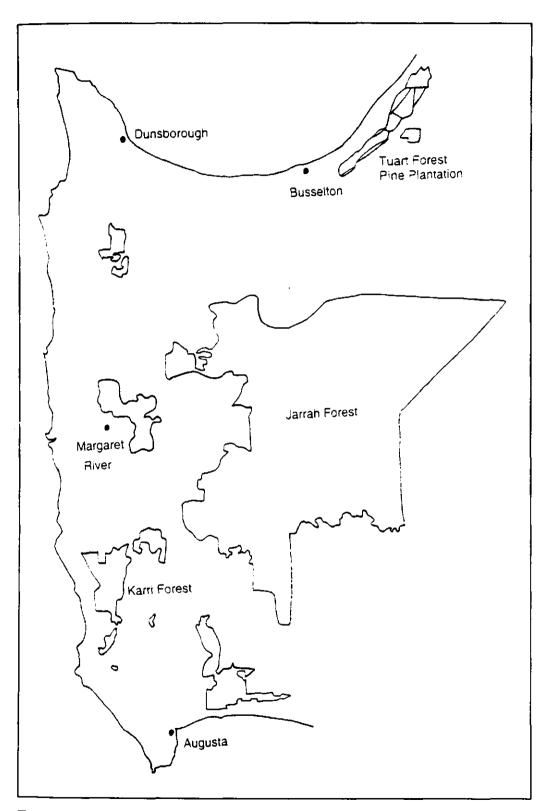


Figure 1: Location of forests in the Leeuwin-Naturaliste region

Source: State Planning Commission 1988

# Location and pre-European tourism and recreation

The Leeuwin-Naturaliste Region is located approximately 250-300 kilometres south of Perth. It contains three main forest types which flourish in the warm Mediterranean climate. There is a small pocket of remnant tuart forest (Eucalyptus gomphocephala) at Ludlow north of Busselton. The largest forest area to the east is jarrah (Eucalyptus marginata) and marri (E. calophylla), whilst to the south at Borranup there are significant stands of regrowth karri (E. diversicolor). There are also peppermint woodlands around the coast with a pine plantation near the Ludlow Tuart Forest.

Before the European invasion in 1829, the forests of the region were utilised extensively by Aboriginal people who managed the unique environment for more than 40,000 years. The Nyungar people of the region are known as the Wardandi Nyungars which means 'The people that live by the ocean and follow the forest paths' (Collard 1994: 51). The Wardandi and neighbouring Pibelmen people used the forests as a meeting place to relax with others and enjoy the environment.

## **Early Europeans**

Europeans-including a number of prominent English families such as the Bussells, Turners and Molloys—first settled the Leeuwin-Naturaliste Region in 1830, following the allocation of all the favourable land grants at the Swan River Colony and personal persuasion by Governor Stirling himself. The first settlement was established at Augusta but due to a variety of factors, including the difficulty of clearing the hard timber with English axes, the settlers abandoned Augusta and relocated to Busselton after only a few years. The tuart forest in particular became a prime agricultural location as Kay (1985: 11) explains that 'the tuart forest presented an open landscape with a wide variety of native grasses, its land was eagerly sought after for cattle grazing.' Not surprisingly, the first Europeans were more focused on survival in this new harsh environment and identified economic opportunities in cutting down the forests, rather than preserving them for future tourism and recreation potential. As Kay states, 'historically, coastal forest areas have seldom fared well in the sequence of colonial arrival, settlement and development. They are the first point of contact, supplying the basic needs of fuel, construction material and export income for the new community."

## Timber cutting and land alienation for agriculture

The timber industry in the Leeuwin-Naturaliste Region grew rapidly from its beginnings as an alternative income source for the new European settlers in the 1830s. Initially, there were the difficulties to overcome of a lack of skilled labour, capital investment and distance from markets. The introduction of convicts in the 1850s, however, relieved some of these problems, although it was not until the 1870s that well financed entrepreneurs entered the local industry. They

established the necessary infrastructure for the industry and associated settlements to prosper and expand until the turn of the century (Sanders 1998: 355). Until this time there was very little concern for conservation of the forests in the region, or much thought on its tourism potential. The *Forests Act* and formation of a Forests Department in 1918 resulted in the formation of the first two State Forests, Number 1 and 2, in the Leeuwin-Naturaliste Region. This land between the Capel and Ludlow Rivers which contained 1385 hectares of prime tuart forest, the last remaining remnant of the species, was repurchased from private land owners, primarily for the growth of tuart (Kay 1985). In 1920 the Forests Department established its own mill at Wonnerup Beach, and a new mill at Ludlow which produced timber for the government railways and which operated on and off between 1955 and 1974 (Kay 1985)

In 1988 the timber industry, whilst significantly downsized to one mill at Witchcliffe and two at Busselton, was still in operation in the region producing timber for the building industry, local furniture and crafts with some production of railway sleepers for export (State Planning Commission 1988). According to surveys in the 1980s, hardwood production in the region was expected to decline rapidly, with a projected increase in tree farming particularly in the Margaret River Shire (ACIL 1987; Shire of Augusta Margaret River 1992)

Much of the land in the east of the Leeuwin-Naturaliste Region contains state managed forest blocks as a legacy of the timber industry, with a number of smaller blocks in the west which are surrounded by private land holdings. These blocks provide examples of remnant vegetation, with potential conservation and recreation/tourism values. There has been much controversy surrounding these blocks in recent years, with the Western Australian Tourism Commission claiming that the lack of identification of specific blocks to be logged is creating insecurity in the tourism industry (Western Australian Tourism Commission 1998). For example, it recommended that the Yelverton block (1100 hectares in Busselton Shire) be reserved and excluded from logging.

A major reason why the timber industry was so strongly supported by various governments during the nineteenth and for most of the twentieth century, was that it contributed to the clearing of land for agriculture. The region was promoted from the beginning of occupation as providing the 'yeoman ideal'; where middle class people of Western Australia could establish small scale profitable farming, with associated settlements. In the 1920s this ideal was further promoted in the south-west of Western Australia by Premier Mitchell who established the group settlement scheme. This project involved granting land to new English migrants who would in turn create a dairy industry in the region. For a variety of reasons this scheme largely failed in this region with many farmers simply walking off the land during the depression (Blond 1987; Gabbedy 1988). The eastern part of the Leeuwin-Naturaliste region, which the Forests Department referred to as the 'Sunkland area' has not been alienated for agriculture because:

the Sunkland was unattractive to the early settlers who passed it by for the more remote but more fertile land. Very little of it has been alienated for agriculture, due no doubt to its obvious poor soil quality...Almost the entire

Sunkland area was traversed by land classification teams from the Lands Department between 1918 and 1930. Alienation was not proceeded with, possibly because of the sad experiences at the time with the group settlement scheme (Forests Department 1975: 4).

Thus most of the eastern portion of the region is now covered with remnant and regrowth jarrah and marri forest which still has unknown potential for tourism and recreation development.

## Caves and railway excursions

Limestone caves found in the Leeuwin-Naturaliste ridge have been popular tourist attractions in the region since the turn of the century. The Lake and Mammoth caves were opened 1901-02 and Yallingup in 1904 (Watson 1990). There are approximately 360 known caves in the ridge. Some are open for adventure cavers only and others occur on private land (Department of Conservation and Land Management 1987a). In recent years there has been a growing awareness of the need to protect not only the caves but also the forests above them. As Watson (1990: 33) states, 'caves need to be protected from obvious damage and more subtle influences such as surface land use: not just in the areas immediately above them but in the entire catchment area of any streams or drainage lines that enter them.'

Perhaps the first attempt at large scale forest tourism in the Leeuwin-Naturaliste region was the very popular railway excursions of the 1920s and 1930s. A railway link from Augusta through Margaret River and Busselton to Perth was established then for the group settlers and it also provided the opportunity for weekend excursions to the forest by people from Perth (Hewett 1975). Smiths tourist guide to Western Australia in 1924, states that,

Within easy distance of the caves are situated the magnificent forests which have made the state famous for its hardwoods. Quite apart from their industrial interests they present a scene of such imposing grandeur that the visitor stands in awe of their midst [sic], feeling like a pigmy venturing into a kingdom of giants (Smith 1924: 18).

## 1960s and 1970s

With the popularisation of the motor car in the 1960s, many more people from Perth had the necessary transport to visit the forests of the south. As is the case today, many of the access roads were provided by the Forests Department's activities in the region. During this period there was also a noticeable change in the attitude of the Department towards tourism, with the first visitor survey for near-city forests conducted in 1969 (Hewett 1975).

Despite this new-found recognition of tourism and the fact that the Department was the provider of most of the associated infrastructure, the Forests Department did not see a significant role for itself in this new industry until 1977. In 1975 for

example it stated that it was 'not considered wise at this time to actively encourage or promote additional forest use until finance is available to service it properly' and thus, 'the general policy is opposed to creation of additional camps within the forest' (Hewett 1975: 12-15). It was also expressing concern over the impacts of tourism activities in the forest which included motor car rallies, trail bikes, beach buggies, four wheel drive vehicles and horse riding in non-catchment areas (Hewett 1975: 13, 14). The Department further stated that:

The desire of owners to repeatedly prove that vehicles of this kind [four-wheel drive] can force a path anywhere is reflected in the rapid spread of jarrah root rot and increased turbidity of river systems.

Just two years later, however, there appears to have been an identifiable change in government attitude towards forest tourism, with the Department stating that it will, 'continue to favour access to the forest except where there is a risk to either the individual or the forest itself' (Forest Department 1977: 12). Further:

The Forests Department will continue catering for both passive and active tourism through; further picnic sites, walking tracks, self guided motor tours, horse and trail bike riding, access for car rallies, protection of areas for water sports (Forest Department 1977: 11).

There was further acknowledgment of the new role of tourism in the Department's journal: 'The further people become enmeshed in the urban conglomeration, the more they seem to long for the magic and peace of forest landscapes' (Forests Department 1977: 3). It is also interesting to note though, that the Department was stating that, 'noteworthy is the fact that virgin forest is not necessary to furnish a popular forest setting' (Forests Department 1977: 5). In further recognition of the role of tourism, or perhaps in an effort to conceal forestry activities from these new mobile travellers, the department enacted a policy of allocating a strip of forest 400 metres wide on either side of major roads in which 'wood harvest operations would be curtailed or excluded where they would conflict with their scenic value' (Forests Department 1977: 5).

The Leeuwin-Naturaliste National Park is perhaps the most prized forest tourism destination in the region. In 1998 there were 72 licensed tourism operators working in the park (Department of Conservation and Land Management 1998). The park, which was gazetted in the late 1970s, comprises 28 separate reserves which cover an area of 15,600 hectares along the coastline from Bunker Bay to Augusta (Department of Conservation and Land Management 1987a). In addition to the aesthetic and conservation qualities of this park, it also contains some of Australia's oldest Aboriginal sites dating back 37,000 years (Cribb 1988).

Visitation to the park has been steadily increasing with an estimated 30,000 people in 1988 which was double the figure of ten years prior (Cribb 1988). A visitor survey in the mid-1980s identified that over 75 per cent of visitors were from Perth, with 50 per cent of those age 15-25 in contrast to other parks where visitors tend to be over 40. In addition 54 per cent of park visitors used the park as access to water based activities, such as fishing and surfing. In 1998 despite

much local protest, fees to visit the most popular locations in the park were introduced (Department of Conservation and Land Management 1998).

#### 1980s and 1990s

Forest tourism and recreation continued to develop in the Leeuwin-Naturaliste region through the 1980s with a rapid improvement in road systems triggering a corresponding growth in visitor numbers (Haynes 1989). According to the State Planning Commission:

Recreational use of the forest tends to focus on areas which are associated with rivers and streams. The Blackwood Valley is a major focus for forest based recreation, and this is partially reflected by the Conservation Park which follows the river (State Planning Commission 1988: 41).

Popular recreation activities include bushwalking, surfing, caving, picnicking and sightseeing. A visitor survey conducted in the central and southern forest regions as part of the regional forest assessment process revealed that 18.3 per cent of respondents stated they had visited jarrah or karri forest. It is estimated that 208,500 day trips were taken in the year. Driving to sight-see or just for pleasure accounted for 58.1 per cent and some form of bushwalking/hiking/walking accounted for 50.6 per cent (the categories are not mutually exclusive). Most of these visitors stay in key nodes in the region and make their trips to the forest from them (RFA 1998d). Other popular activities include canoeing on the Blackwood River which is one of the few rivers in the south-west which is suitable for canoeing all year round, and walking the forest trails along disused forestry access routes. The Boranup Drive is the only major scenic drive specifically constructed for that purpose in the region (State Planning Commission 1988).

## Tourism and recreation policy issues

At present most tourism and recreation facilities in the Leeuwin-Naturaliste Region are relatively small scale ranging from walking trails to camping sites and picnic spots which are provided by the Department of Conservation and Land Management. There are also a number of commercial operators in the forests offering attractions such as cave tours, guided forest walks and kyaking trips. As part of the recent Regional Forest Agreement process, tourism was identified as a significant and important land use in the forests of the region, with much of the current infrastructure including towns, roads and car parks, based around facilities to which the timber industry has been a major contributor (RFA 1998a). According to the Regional Forest Agreement documents, 'Forests are an important drawcard to leisure-based tourism and recreation, and form a significant part of the nature-based package that the State of Western Australia has to offer' (RFA 1998d: vi). The documents also provide an appraisal of visitor activities, which indicate that the forests were a significant attraction for visitors, and that

forests have a broad scenic appeal and form an integral part of the whole tourism package for visitors to these regions (RFA 1998d: vii). The process estimates that \$44.2 million is associated with tourists who visited the jarrah and karri forests in the central and southern regions (RFA 1998d: vii). However, it also identifies that there are no published growth estimates for forest-based tourism (RFA 1998d)

In 1988 the State Planning Commission identified improving the recreational potential of state forest, conservation and contribution to character as major policy issues for the region's forests (State Planning Commission 1988). In recent years the issue of old-growth forests has also become an important topic in the discourse on forest tourism. According to the Western Australian Tourism Commission 'Preservation of old-growth forest is essential if increasing numbers of visitors to the south west are to be serviced'. It suggests that:

the preference of visitors is to experience a sense of awe and wonder at the sheer size and majesty of what surrounds them. People want to feel a part of something that is greater than themselves (1998: 11).

The Regional Forests Agreement also recognises tourism as an important forest use stating, 'The combination of marketing and the development of forest facilities is expected to capitalise on the growing nature-based tourism market which is believed to be expanding at 20-30 per cent per annum' (RFA 1998d: ix). However, upon closer examination of the Commission's own table (Table 1), it can be clearly seen that visitor levels to sites in the Leeuwin-Naturaliste region have remained stable or actually declined during the 1990s.

Table 1: Visitor levels to Department of Conservation and Land Management sites in forest areas in the Central Region

District/Park	Total visits (000's) for years to 30 June					ne
	1993	1994	1995	1996	1997	Trend
Busselton:						
Blackwood River	46	45.5	45.5	28	28	down
Bob's Hollow		5	5	5	5	same
Cosey Corner Road		12.5	12.5	12.5	12.5	same
Margaret River	6	6	6	6	6	same
Other State Forest	2	1.8	1.8	1.8	1.8	same
Tuart Forest Area	6	6	6	6	6	same
Scott River N.P.	4	4	4	4	4	same
Leeuwin-Naturaliste:						
Boranup	34	30	30	15	22	down/up
Cranebreak Pool				5	5	same
Chapman Pool				7	7	same
Conto	69	94	94	99	84	up/down
Sue's Bridge				11	11	same
Ten Mile Brook				5	5	same
Tuart Drive				167	167	same

Source: RFA 1998: 37

The Regional Forest Agreement document also acknowledges that forest based tourism needs to be compatible with other uses, and that this will be facilitated by ensuring that future forest management plans involve greater consideration of tourism issues. In response the Department of Conservation and Land Management is establishing a forest-based recreation and tourism advisory group to assist in the development of tourism and recreation initiatives (RFA 1998d). The Department appears to have had another policy shift in regard to tourism, now actively facilitating the development of large scale facilities such as the tree top walk at Walpole, and encouraging partnerships with private enterprise to further develop forest sites (Shea 1998). The Tourism Commission, however, is critical of this approach, claiming that the requirements of tourism have not been understood in the Regional Forest Agreement process, which claims that 'most high use tourism facilities in forests involve site based and corridor based (Western Australian Tourism Commission 1998: activities'. Commission suggests that:

Site specific development will not attract the growing numbers of adventure and cultural tourism visitors which according to a Stanford Research Institute Study is estimated to grow at 10-15 per cent per annum or capitalise on the growth of nature based tourism which Stanford estimates to be growing at 25-30 per cent per annum. (Western Australian Tourism Commission 1998: 11).

The Commission also suggests that tourism can provide alternative futures to logging for communities, citing the examples of Northcliffe and Walpole where mills have closed but towns are growing due to increase in tourism.

## **Environmental impacts**

Tourism and recreation, like every other land use in the forests, has their associated impacts. Degradation of vegetation and the landscape through overuse can create instabilities and erosion (Department of Conservation and Land Management 1987a). According to the Department, 'degradation to the landscape, loss of site amenity, and eventual impairment of physical access all reduce visitor satisfaction'. Vandalism occurs by littering, use of live wood for fire wood, walking or driving over environmentally sensitive areas such as mossy granite outcrops, shooting at signs and engraving initials into smooth bark. Managers can also vandalise to create a tourist attraction, by nailing signs on trees for example (Burrows 1982: 7-8). According to Burrows, 'a sign that directs tourists to a jealously guarded beauty spot can be expected to vanish or be damaged by local people who have no wish to share the area.' Damaged or poorly maintained sites and facilities also tend to encourage vandalism. According to the Department, 'the provision of quality nature based recreation, educational experiences and a sense of partnership should diminish [undesirable impacts]' (Schmidt 1995: 21).

#### Future forest tourism and recreation

Tourism and recreation has significant potential in the Leeuwin-Naturaliste Region as in other parts of the south-west. The recently signed Regional Forest Agreement has allocated \$17.5 million for tourist projects in the State's forests. This includes \$2 million for eco-lodge, camping and chalet sites including one in the Leeuwin-Naturaliste Region, with a further \$2 million assigned for the sealing of Mowen Road which will upgrade the tourist access between Nannup and Margaret River through the jarrah forest. In addition three forest blocks along the Leeuwin-Naturaliste Ridge will become National Parks as will sections of other blocks along the Blackwood River (Western Australian Regional Forests Agreement 1999). In conjunction with these government initiatives there is also considerable scope for private development. This leads to the question of what kind of tourism is required? Should the projected growth in ecotourism be supported, or is there a need for more site-specific, man-made attractions such as the tree top walk and forest heritage centre? Much more research is required if tourism and recreation are to contribute to providing a sustainable alternative to more exploitative activities in our forests. On a more practical note, retraining has to be offered to those in the timber industry who are understandably reluctant to become ticket sellers and cleaners. Perhaps we need to tap into their knowledge. combined with a greater appreciation of Nyungar respect for the forest environment, which would perhaps provide a unique tourism experience to be offered to both local and international visitors

#### Conclusion

Forest Tourism and Recreation has a long and varied history in south-western Australia. The forests were utilised for thousands of years by Nyungars before the arrival of Europeans, who were primarily concerned with survival in this harsh and alienating environment in the nineteenth century. In the early 1900s, however, there were some who were noting the tourism and recreation potential of the forests, with some facilities such as railway excursions and caves being developed in the early part of this century. It was not until the 1960s, though, with increased car ownership and greater environmental awareness that people began to venture out into the forests for tourism and recreation in large numbers. This trend has continued with the recent Regional Forests Agreement acknowledging that tourism is an important industry in the forests, however, for tourism and recreation to continue to develop and possibly provide an alternative to logging in the future much more research is required.

## Acknowledgements

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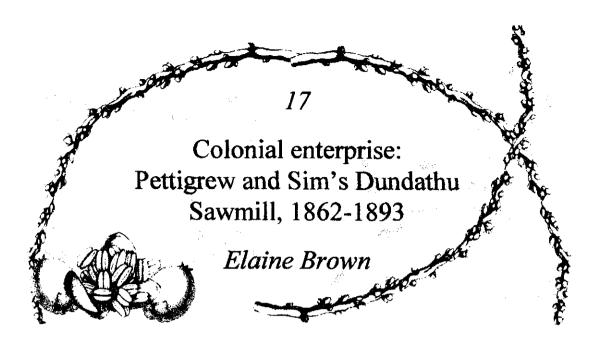
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# Using





William Pettigrew was a man of firsts. A young Scottish surveyor, he arrived in Brisbane 150 years ago on the Fortitude, the first of three immigrant ships sponsored by the Rev. Dr John Dunmore Lang. Four years later, he built a shed on the bank of the Brisbane River, imported second-hand sawmilling equipment from Scotland, and set up the colony's first steam sawmill, thus bringing the Industrial Revolution to a primitive settlement which had, until then, jolted along on human, animal and wind power. For forty years, until fire, floods and economic depression destroyed his business, William Pettigrew was Queensland's leading timberman. Inventive and energetic, he maintained this position by spending time and money on exploration, expansion and technical innovation. He built four sawmills, owned a fleet of ships, constructed Queensland's first private railway and ordered Queensland's first locally-made steam locomotive.

In 1855, two years after the Brisbane Sawmills began turning out sawn timber, the local pit-sawyers, fearful of losing their jobs, burnt it down. Although injured in the fire, Pettigrew was back in business two weeks later, earning for himself an enduring reputation for courage and perseverance. He did not, however, take all the credit for this achievement. The man who got the machinery running again, he said, was his sawyer and foreman, William Sim; and it is the partnership between these two men—Pettigrew and Sim—in a sawmill near Maryborough, that is the subject of this paper.

After Queensland became a separate colony from New South Wales in 1859, its fledgling government actively recruited British and European immigrants, and began an ambitious program of public works. Pettigrew's Brisbane business was booming, so he set himself a new goal—to dominate the timber trade in the northern ports of the expanding colony: Maryborough, Rockhampton and Bowen.

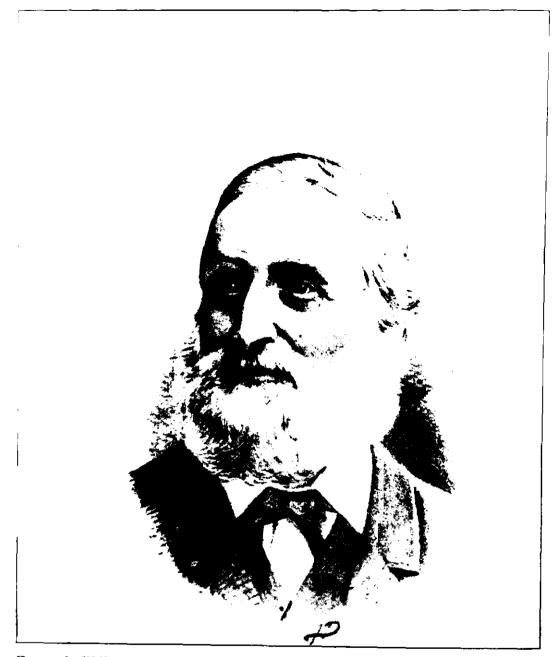


Figure 1: William Pettigrew, 1888 (from Australian Representative Men)

In August 1862, he travelled by coastal steamer to the tiny port of Maryborough in search of new sources of timber and a place to build a sawmill. Along the Mary and Susan Rivers, on Fraser Island and at Tin Can Bay, he located forests of well-grown kauri and hoop pine; and in the Agricultural Reserve, on a long reach of the Mary River some distance downstream from Maryborough, he bought 200 acres [80 ha] of land for his proposed sawmill.

At the Brisbane Sawmills, Pettigrew had endless problems providing a sufficient and reliable water supply for his boilers. The site on the Mary River was chosen chiefly because it contained a fresh-water lagoon—which is still there. In October 1862, Pettigrew spent a week surveying the site and drawing up

plans for the sawmill, which he named Dundathu. The meaning of this word is disputed. Pettigrew treated it as an Aboriginal name for kauri pine, which he always called 'Dundathu pine'. This is the meaning also given by his friend Tom Petrie, who called it *dundadum*, and by Zachariah Skyring, who listed *dundathu* and *dunda* (which also means 'bald') as names for the tree. The story handed down in the Sim family, however, is that it meant 'place of dead trees', and the ethnologist F.J.Watson wrote that it came from the Kabi Aboriginal words *dhan dau wa dhu*, meaning 'place of timber'.



Figure 2: Dundathu Sawmill, Mary River 1870s (John Oxley Library, State Library of Queensland, JOL 22636).

It was Pettigrew's habit to record in his diaries a nail by nail description of the construction of his sawmills, so it is possible to follow the building and equipping of Dundathu during the year he travelled back and forth to supervise the project. All transport to the site was by water, because the overland route to Maryborough lacked bridges; and most of the materials were sent from Brisbane. But the discovery of a clay deposit on the property enabled Pettigrew to employ a brickmaker to produce on site the tens of thousands of bricks needed for chimneys and foundations.

In November 1862 the Maryborough Chronicle reported that the men Pettigrew had employed to clear the site had been attacked and robbed by Aborigines. In January 1863 Pettigrew called at Dundathu on his way to Rockhampton and reported that the ground was cleared and the postholes cleaned. In April he supervised the clearing of the swamp and during May and June made a number of trips to check on the building of the mill itself. On 15 June he purchased his first 'raft of dundathu pine timber at 4 shillings per 100 feet [0.24 m<sup>3</sup>]'. By early July, the wharf and the brick chimney were finished, and some of the machinery, including the boilers, had arrived. During July, construction of the workers' cottages and a prefabricated house for William Sim and his family proceeded rapidly.

Sim, who initially paid Pettigrew £200 for a one-quarter share in the firm, arrived at Dundathu on 21 July to install and test the machinery. On 22 August the boilers were fired, the saws began to whine, and Sim took control at Dundathu as Pettigrew's manager-partner. For thirty years, until the sawmill burned down on Christmas Day 1893, Dundathu was a landmark on the Mary River. The sawmill and wharf on the riverbank and the lagoon behind them were encircled by a ridge of high ground, where members of the Sim family built their houses. At the southern end of this ridge stood the teacher's house, and next to it the school, which on Sundays became a church. Near the mill, the workers were housed in two rows of small cottages, each two cottages sharing a common wall and chimney. Dundathu was far enough from Maryborough to be a self-contained village, a prototype of today's 'company town'.

In 1923, thirty years after Dundathu's demise, the Maryborough Chronicle published a piece on its glory days:

Those were the days when the mighty giants of the scrub, magnificent pines and cedars, towered aloft in glorious majesty in the dense scrubs at Tin Can Bay and Fraser Island and along the upper reaches of the Mary, Burrum and Isis Rivers—the type of logs, immense in girth, which in the same abundance today would readily make millionaires. Pioneers speak of pine logs—hoop and kauri—cut down like a mighty ship's tank to 63 inches [1.6 m] square in the old mill at the height of Dundathu's prosperity—logs from which boards of the same width were stripped; some of the logs over 7 feet [2.1 m] through at the butt, almost too big for the frame. Those were the pride of the early day scrubs. Now they have mostly fallen... before the bite of the axe and the saw, taken away by snigging bullocks, the groaning wagon, the 'steam horse' or the floating rafts.

Transport was a major problem in the timber industry. Pettigrew had become impatient with the cost of hiring slow, clumsy sailing vessels to tow rafts of logs from Moreton Bay upstream to his Brisbane Sawmills. Steamships had better control when navigating the bars and inlets of South Queensland waters; so, while Dundathu was being built, he took the *Granite City*, a sailing ship of which he was part-owner, lengthened her by 18 feet [5.5 m], installed an engine and turned her into a paddle-wheel steamer, which he named *Gneering*, an Aboriginal word for the black swan.

As soon as Dundathu was operating, Pettigrew set off in the *Gneering*, seeking further supplies of timber. In September 1863 he explored the Noosa River and discovered the kauri pine forests of Kin Kin Creek. Two years later, he spent a month making the first map of the coast from the Maroochy and Mooloolah Rivers north to Tin Can Bay, where his explorations led him to take up Special Timber Licences and later free selections over the kauri pine forests of the Cooloola Sandmass. After 1865, most of Dundathu's supplies came from rafts made up in Tin Can Bay and then towed on a long, frustrating journey, through Great Sandy Strait and up the Mary River to Dundathu. For the task of towing these rafts, the firm of Pettigrew and Sim in 1872 acquired the steamer *Hercules*.

As an apprentice surveyor in Scotland, Pettigrew had worked on the railways that were then being built there; so it was natural that, wherever he went, he

envisaged railways as a solution to the problems of land transport. On his journeys of exploration, he often noted where a railway could be used to extract timber from difficult or remote locations, and he experimented with moving timber around on lengths of rail in the yards of his sawmills. In 1871 he spoke to the Philosophical Society about railways, 7 and the same year he gave evidence to the Commission Inquiring into the Proposed Extension of the Western Railway8—on both occasions referring to his own experiences.

All his ideas came to fruition in 1873, when in Northern Cooloola he constructed a wooden railway to transport logs from the inland forests to the waterside at Tin Can Bay. The Cooloola Railway was the first privately-owned railway in Queensland. The *Mary Ann*, the locomotive built for the line by John Walker and Company of Maryborough, was the first steam locomotive to be built in the colony. The engine took its name from Mary Ann Sim and Mary Ann Pettigrew, daughters of its proud owners.

William Sim contributed some of the capital for the Cooloola project when in 1871 he increased his share in Pettigrew and Sim to one-half with a payment of £3,750—an amount which, compared with the £200 he had paid for a quarter share eight years earlier, gives some idea of how successful his management of Dundathu had been. Pettigrew contributed to the Cooloola Railway by surveying the line and ordering the materials. He also helped to supervise the laying of the track, and his diary reveals how much this wealthy Brisbane alderman, churchman and public figure enjoyed living with his timber-getters in their rough camps, tramping through the damp and isolated scrubs at Tin Can Bay, and solving the technical problems that beset the project. Management of the operation remained with William Sim at Dundathu, and with Robert Black, who was for many years the firm's overseer at Tin Can Bay.

Pettigrew was not present at the opening ceremony of the railway in October 1873, when the Sim family treated thirty prominent Maryborough citizens to three days of festivities. Two of the guests were Forster the photographer and a reporter from the Maryborough Chronicle, who between them left a remarkable record of these events. The steamer Hercules, flying the company flag featuring circular and frame saws, chugged down the river, to the accompaniment of Duncan the Piper's bagpipes. At South White Cliffs on Fraser Island, a caterer provided the guests with a satisfying dinner. Then they settled down to sleep on the deck of the Hercules, as she threaded her way through the moonlit channels of Great Sandy Strait and Tin Can Bay, waking in the morning to find themselves in the mud and mangroves of Cooloola Creek at low tide. Many of the guests, including the portly Mayor, fell into the water as they tried to get from ship to shore.

That day, the guests enjoyed rides up and down the railway track, with Robert Black as engineer and 15-year-old Robert Sim as driver of the amazing Mary Ann. At the inland terminus, the Mary Ann was coupled to a sawbench to demonstrate how she could be used as a stationary engine to cut cypress pine sleepers for the track and her own firewood, and Forster the photographer patiently arranged the company for a photograph. This extraordinarily clear picture shows

Forster directing operations, Duncan the Piper again entertaining, and—something entirely omitted from the reporter's account—half a dozen Aborigines observing the scene, some perched in the trees above.

The guests slept that night at the Cooloola Creek terminus, and on the third day enjoyed more bountiful supplies of food and drink. Speeches were made, congratulating William Sim on his achievements, and before they boarded the *Hercules* to return to Maryborough, Forster took a second photograph, showing Sim demonstrating the unloading of logs from a wagon at the Cooloola Creek terminus.

Sadly, within three weeks of the opening, William Sim was killed in a tragic accident at the very spot where Forster had taken his second photograph. At about 5.30 on the evening of Monday 17 November 1873, as Sim unhooked the chain that fastened logs to a wagon and threw it across to Robert Black, a log unexpectedly rolled off, hitting Sim in the back and crushing the lower part of his body, and also injuring a man named William Cooper. Young Robert Sim, standing on a raft of logs in the creek, heard the splash of a log hitting the water and, looking up, saw his father and Cooper lying on top of the bank near the trucks. Robert Black attended to Sim and Cooper as best he could, then went to get help. Young Robert was with his father when he died. 10

When Black returned at about 9 o'clock, the injured Cooper and Sim's body were placed in a small boat, and the party set out for Maryborough. A messenger sent overland reached Maryborough with news of the accident on Tuesday afternoon, and the *Hercules*, with Dr Power on board, immediately set out for Tin Can Bay, meeting the boat on the way. On receiving news of Sim's accident, Pettigrew boarded the first available ship for Dundathu and took charge of funeral and business arrangements. Sim's grave in the Maryborough Cemetery is marked by a tall stone, designed by Pettigrew, on which is carved the company symbol of a circular saw.

After Sim's death, Pettigrew continued his partnership with the Sim family and looked after the interests of Ann Sim, who had been left to care for four sons and five daughters aged between twenty-two and four. William Menzies, husband of Mary Ann Sim, became manager at Dundathu until his death in 1882. The two oldest Sim sons, James (known as Tertius) and William Simpson Sim, who were only 22 and 20 years of age when their father died, eventually became managers of both the Dundathu operation and the Union Sawmill, which Pettigrew and Sim had leased in 1870. This mill cut hardwood, and was located in Maryborough's main street. In 1889 it was rebuilt and renamed the Urara Sawmill, Urara being an Aboriginal name for spotted gum.

For the next twenty years, Pettigrew continued to give advice and regularly visited Dundathu to 'do the books', but his relationship with the Sim children, although cordial, lacked the closeness that had characterised his relationship with their father. Whereas, at the opening of the Cooloola Railway, William Sim had stressed Pettigrew's contribution, saying, 'Mr Pettigrew is at one with me in all these works', his sons naturally preferred to emphasise the contribution of the Sim family to the firm's achievements.

Sim's death temporarily stopped the building of the Cooloola Railway, but by 1876 accessible kauri pine had been cut out and it became necessary to tap two new areas—first, a gully known as the Tramway Scrub, and then, the biggest challenge of all, the Broutha Scrub. From 1875 to 1877 Pettigrew extended the line inland, but it took him a long time and much thought to devise a method of extracting timber from the Broutha Scrub, which was totally enclosed by high sand dunes. He took the railway track up the dune on a side cut, where it crossed the ridge, then ran down into the Broutha Scrub on an embankment. The Mary Ann was used within the Broutha Scrub to bring loaded wagons to the foot of the dune, and a new, more powerful locomotive, the Dundathu, took the logs back to the coast. Pettigrew installed a stationary engine on top of the ridge, and a loaded wagon was kept there at all times. When another wagon arrived, it was fastened to the one at the top of the ridge. The stationary engine applied a counter-balancing force and steadied momentum as the top wagon moved down the outer slope, hauling the lower one up. 12

The Cooloola Railway eventually ran for fifteen kilometres from its second coastal terminus—which was extended to Poverty Point in 1877—to its furthest inland terminus near the Pot Hole in the Broutha Scrub which was reached in 1878. The Broutha operation lasted five years, and in 1884 Pettigrew paid a final visit to the railway, measured the girths of some of the remaining kauri pines to compare some future time, and noted how quickly regrowth sprang from their roots after a fire. He sent the stationary engine and the locomotives *Mary Ann* and *Dundathu* back to Dundathu Sawmill, and put them up for sale. <sup>13</sup>

The wooden sleepers and rails were left to moulder away, and the metal fittings became buried in the sand. Most of the line was consumed by the fires which frequently burn the eucalypt forest and wallum vegetation on the coastal side, but moss-covered rails are still visible in the Broutha Scrub, and the railway can be traced for its full length without much difficulty. Now that the Cooloola Railway is entirely protected within a National Park, and its history has been compiled, it would be appropriate for archaeologists to carry out a proper survey of what remains; and I hope that funds will soon become available for this fascinating task.

With the closure of the Cooloola Railway, Dundathu Sawmill lost its chief source of supply, and its output began to decline. The firm spent a lot of money upgrading the mill after it was unroofed by a cyclone in 1892 and inundated by record floods in 1893.

Eighteen-ninety-three was the worst year of Pettigrew's life. Not only did the floods damage his sawmills, but they also cost him all but one of the ships in his fleet. The economic depression which followed severely affected the highly competitive timber trade. In September, his wife died. Then, at Christmas, he received word that Dundathu Sawmill had been burnt to the ground. 14

After the firm of Pettigrew and Sim was bankrupted, Pettigrew continued to operate his Brisbane and Maroochy Sawmills until 1898, when, after years of economic depression and another great flood, his liabilities so far outweighed the

value of his assets that the Union Bank foreclosed on him. The Sim family operated the Urara Sawmill in Maryborough until 1929, when it burnt down.

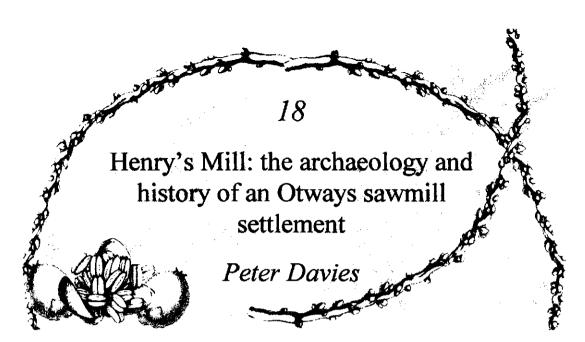
The success of Pettigrew and Sim was due initially to Pettigrew's ability to translate vision into practice using his business acumen and technical knowledge, combined with William Sim's practical and managerial skills. The firm also had the advantage of being the first to tap into a timber resource of unusual quality and abundance.

Other firms followed their example and introduced wooden tramways to extract timber. For example, Pettigrew's rivals at Noosa, McGhie, Luya and Co., constructed tramways built on embankments along Kin Kin Creek, and used draft horses to draw trucks of logs to their mill at Lake Cootharaba; and early in the twentieth century, Edward Armitage constructed railway lines among the dunes on Fraser Island.

In Maryborough in 1999, with funds from government and private sources and a dogged determination worthy of Pettigrew and Sim, Peter Olds, of William Olds and Sons foundry, completed the construction of a full-scale replica of the historic locomotive, the *Mary Ann*.

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Timber-getting in Victoria from the 1860s to the 1930s was characterised by a large number of sawmills which operated in remote bush locations, and relied upon rough tracks or timber tramways for transport and communication with the outside world. At the most isolated mills, which remained in one location for any length of time, employees were often forced to live permanently on site, forming small, remote settlements deep in the forest. Such small communities generally featured timber cottages, huts, and a boarding house, while the presence of women and children created a demand for commodities and schooling. Most historical research of forest industries in Victoria has concentrated on the light railways, timber tramways, and sawmilling technology employed during this period. Largely neglected, however, has been investigation into the lives of men, women and children who created forest settlements around these remote sawmilling operations. Henry's No.1 Mill is a typical example of such a forestbased settlement, operating in the Otway forests of south-west Victoria from 1904 till 1927. Its remote location, length of operation and archaeological potential provide a valuable opportunity to explore the material culture, settlement geography and environmental responses of an isolated, poorly documented sawmill community. Detailed investigation of Henry's Mill, now on the very edge of living memory, offers the chance to explore a way of life and industry long since passed.

# Otways timber industry

The forests of the Otway Ranges were characterised during the nineteenth century as one of the most valuable timber resources in Victoria (Ivey 1874: 7). Observers commented not only on the 'grandeur and magnificence' of the trees in the region, but also on their apparent inexhaustibility (Hebb 1970: 387).

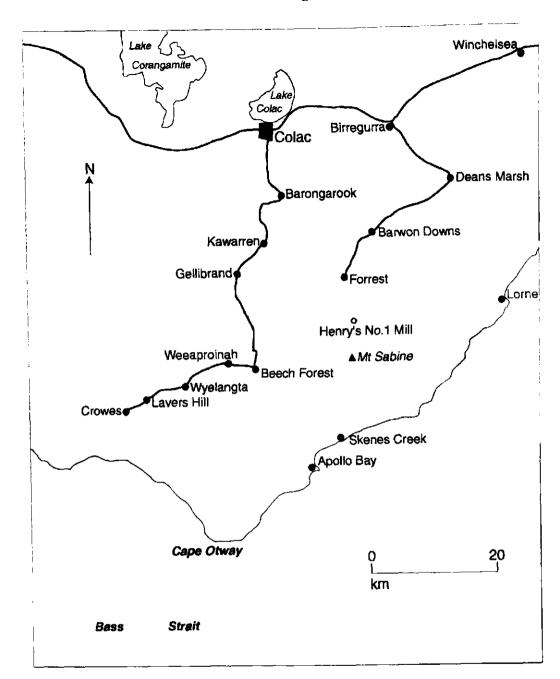


Figure 1. Otways railways

Members of the 1897 Royal Commission on State Forests and Timber Reserves characterised the range as 'a rugged and broken tract of country traversed by hill ridges, with deep gorges or creek valleys lying between, the whole clothed with a magnificent mixed forest of valuable timber trees' (Tucker et al. 1899: 6). The flora of the area was initially noted for its extensive stands of blue gum, grey gum, mountain ash, messmate, blackwood, myrtle beech and satin box. Pastoral development of the ranges began in 1839, and the earliest timber-getting commenced along the coast at Apollo Bay and Lorne in 1849, supplying railway sleepers, and bridge and wharf timbers. Although this trade lapsed in the 1860s

due to inadequate loading facilities, the construction of a new jetty at Apollo Bay in the early 1880s prompted a resurgence in the local industry (Brinkman and Farrell 1990: 73-6).

The opening of several railway branch lines between 1890 and 1911 linked the Otways to the main Geelong line, and resulted in the rapid expansion of the timber industry throughout the region (Figure 1). Timber millers from around Ballarat moved into the area between 1895 and 1905, and came to supply the great quantities of timber required on the central Victorian goldfields. The early decades of the 20th century were thus boom times for timber production in the Otways, with extensive sawmilling operations established at Forrest, Barwon Downs, Birregurra, Beech Forest, Gellibrand, Lorne, and numerous other settlements. Timber tramways provided the essential transport links between forests, sawmills and railways in this period, replacing the bullock teams of the 19th century. Constructed of wooden and later steel rails laid over closely packed sleepers, the tramways carried logs and sawn timber to the nearest railway station or jetty. Isolated sawmilling settlements in the depths of the Otway forests depended on the tramways for almost all of their needs. By 1919, 300 kilometres of timber tramways had been laid in the Otways (Haughton 1988: 295).

Subsequent years witnessed a gradual transformation of the timber industry in the region. Ex-army surplus vehicles flooded the market, resulting in road transport competing successfully with rail in terms of timber transport and delivery. Continued depletion of timber resources, the 1929 Timber Strike, and the devastating bushfires of 1919, 1926 and 1939, combined to reduce timber outputs in the region. By the Second World War, tramways had become outmoded, and gradually deteriorated through age, fire and neglect, as sawmills were generally moved out of the bush and into towns.

## Site history

Henry's No.1 Mill began around the turn of the century as a partnership between between Thomas Cowley, William R. Henry, James Whitelaw and John McGregor. Large reserves of high quality, untouched forest, possibly up to twenty years' supply, had been identified in the West Barwon Valley, but access to such timber required the construction of a tramway through a spur separating the Noonday and West Barwon valleys. Finance for the construction was secured by Henry, who had achieved success in gold mining at Kalgoorlie and Ballarat, before buying into Otway Sawmills in 1902 (Geelong Advertiser 26 Nov. 1957; Houghton 1975: 51-3). Henry was an enterprising timber merchant and his tramline to the No.1 West Barwon mill incorporated two of only three trainway tunnels ever built in Victoria. He introduced the first steam-powered winch in the Otways in 1908, and steam locomotives played a prominent part in his timber operations (Houghton 1995). Henry concentrated his timber interests in the Geelong, Ballarat and Western District markets. Such was the scale and innovative nature of his milling activities in the area that the No.1 Mill was the subject

of a vice-regal visit in January 1915, by the Governor-General, Sir Ronald Munro-Ferguson, the Victorian State Governor, Sir Arthur Stanley, and members of Parliament. They paid tribute to the mill's operation, and Henry's management of local timber resources (*Colac Reformer* 12 Jan. 1915).

In October 1903, following completion of the tunnel, the three-feet-six-inch [1.07 m] gauge tramline was continued one kilometre south-eastward to the new mill. The designated mill site occupied the only wide and relatively level area in the valley beyond the tunnel. By this time Henry was recognised as the dominant partner in the firm, and was in the process of buying out his partners' interests (Houghton 1975: 51-6). The mill began cutting early in 1904, and rapidly developed as one of the largest in the Otway area, cutting around 10,000 super feet [23.6 m³] of timber per day. Its remote location, ten kilometres south of the nearest township, resulted in a small settlement developing around the mill, served by a butcher, baker, general store, billiard room and boarding house. Family cottages were erected in the north-western part of the site, while huts for single men were built closer to the sawmill. A school opened in 1909, and a post office in 1913.

Otways Saw Mills school No. 3601 was a single-teacher school, which operated for almost nineteen vears between 1909 and 1927. Fifteen different head-teachers taught there; all were male, often young and with limited teaching experience. Their frequent complaints to education authorities in Melbourne about the cold, wet and isolated location of the mill school may also hint at their response to the social environment of the sawmill community. Clifford Stanford, for example, complained in 1911 that the mill is in 'an out-of-the-way place, and is far from being a pleasant place to live' (VPRS 640, 2328). Bernard Flood, in applying for a transfer, felt that 'For months at a time, a teacher is practically a prisoner in the gully, for he cannot get away, even on weekends, on account of the remoteness of the district' (VPRS 640, 2423). Several teachers were dissatisfied with the board and accommodation available to them, which involved either a hut in the school yard or boarding privately with one of the mill families. William Morris, for example, head-teacher for a short stint in 1912 and 1913, was reduced to sleeping in a bed with one of his students (VPRS 640, 2328). Morris later claimed the damp climate lead to his contracting influenza and neuralgia, as grounds for his transfer to a warmer, inland place such as Ballarat or the Western District. Several teachers were also intent on marriage and were reluctant to bring their brides to a school without a proper dwelling, while another complained of the financial burden imposed by providing separately for his wife and child at Geelong, and himself at the mill (VPRS 640, 2639). In several cases teachers appear simply to have ceased duty without permission or explanation, possibly unable to tolerate the delay in appointing a replacement. They were not alone, however, in recognising the isolation of the mill settlement. The name applied to the residential part of the site, 'Port Arthur', reveals a grim humour in the hardships of life in such a community. The No.2 Mill, higher up the valley and even more remote, was known simply as 'Siberia' (Houghton in prep: 150).

Heavy winter rains in 1923 brought damaging floods to the West Barwon valley, carrying away over six kilometres of tramline. In the five months it took to repair the damage, during which time the No.1 mill could not be supplied with logs for milling, Henry kept twenty men with families and other single men on the payroll, aware of the financial dependence of his workers on the mill, and the difficulty of gathering together again a large body of employees should he have to dismiss them. The mill was re-opened in November 1923, and the damaged tramline reconstructed several months later (FCV Henry 29/474).

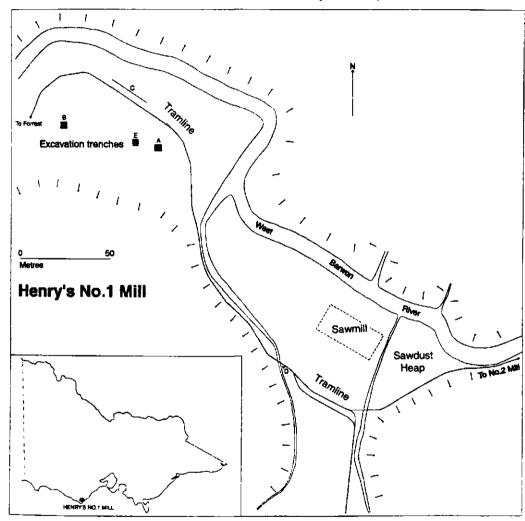


Figure 2. Site plan of Henry's No.1 Mill showing location of excavation trenches

By 1927, workers and residents at Henry's Mill had anticipated for several years that the mill's future was limited. Economically available timber was gradually being cut out, while fire and flood damage, wage disputes and royalty negotiations exerted an increasing financial pressure on the operations of the mill. Diesel engines and road transport were gradually replacing steam engines in the transport of timber, and the mill's isolation from markets eroded its ability to compete effectively with those in more favoured parts of the State. Thus when the

sawmill shed was destroyed by fire in October 1927, a process of gradual, planned withdrawal from the valley was initiated. The school continued to operate until Christmas of that year, while the post office remained open until October 1928. The No.1 Mill settlement was gradually dismantled. The huts and houses worth saving were broken into panels and taken to another mill for temporary re-erection. Logging operations were shifted to nearby mills to cut out the remaining timber. By December 1929 everything salvageable from the West Barwon had been removed, including sawmill plant, boilers, rails and winches. The portals of the tram tunnel were collapsed, and timber-getting in the valley finally ceased.

#### Site context

The site of Henry's Mill is located in the Otways State Forest in south-west Victoria, a twenty minute scramble from the nearest four-wheel-drive access. Inclusion of the West Barwon valley in the regional water catchment system and the exclusion of logging in the valley has resulted in dense forest regrowth around the site which extends along the south bank of the West Barwon River, approximately 230 metres above sea level. It lies in a zone of riparian wet sclerophyll forest, dominated by an overstorey of manna gum, and an understorey of smaller trees, shrubs, ferns and climbers. The mill site itself represents a mosaic of forest regrowth, flood zone scrub and introduced grasses. The Otway Ranges exert a significant influence on local rainfall and temperature, in comparison to the coastal area to the south and the plains to the north. The average rainfall in the West Barwon valley varies between 1500 and 2000 mm per annum, with the bulk of it falling in April-November (Linforth 1977).

Initial assessment of Henry's No.1 Mill revealed that it lay in a large, although overgrown forest clearing, surrounded on all sides by the steep forested slopes of the West Barwon watershed. The industrial part of the site yielded evidence for tramway earthworks, pits, and discarded bricks and tram wheels, while in the residential area to the north-west lay scattered whole and broken bottles, iron piping, occasional ceramics, and low mounds of mixed clay, stone and brick rubble (Figure 2). Linking these two areas of the site was the earth cutting for a timber tramway. Excavation at the site aimed to provide information on various aspects of life at milling communities, including domestic consumption, exchange networks and responses to the environment. Three main excavation trenches were opened—A, B and E—each corresponding to a likely house site. Trench C was an intensive surface collection along the northern face of the tramline cutting, and Trench D was a small lm x lm probe in the area of the single men's huts, to test for the presence of domestic discard. A total area of 71.5 m² was exposed during excavation.

### **Excavation results**

The surface of Trench A was dominated by a large, low mound of clay, up to five metres across and 50 cm high, from which numerous bricks and stones had eroded. Surface artefacts included bottles, ceramic sherds, iron piping and short lengths of rail. There were also numerous components of a cast iron kitchen stove, including the front and top plates, hot plate lids and flue base. A trench, 5 m x 5 m, was established under the canopy of tree ferns, with the excavation of Trench A providing the only distinct stratigraphic sequence revealed at the site.



Figure 3: Hearth foundations, Trench A

Two separate hearth features were identified under the clay mound in this area. The northern feature consisted of a clay platform, 30 cm high and 1.5 metres square, with rounded, possibly eroded, corners. Charred wood on the south and east sides suggest that the platform was originally framed with timber. On this platform was built a small square brick structure, a single course in height, 80 cm by 70 cm across. The central part of the structure was burnt and friable, with a black charcoal stain on several vitrified bricks. Lying along the western edge of this brick structure was a short length of iron rail, 70 cm long. Several metres to the south-east lay a similar length of rail on the surface, apparently removed from its original position. This clay and brick feature appears to have functioned as a hearth, with a small fire lit in the centre of the brick base, perhaps to heat a copper or other flat based vessel supported on the iron rails.

Immediately south of this hearth structure, and separated from it by a narrow, 30 cm wide channel, was a similar feature. It also consisted of a clay platform, 1.4 x 1.1 metres across, on top of which was built a simple brick emplacement. This structure formed a 'U' shape, open to the south-east, with nine bricks laid

flat and end to end. It appears likely that these bricks formed a base for a kitchen stove, with cast iron oven components identified on the surface appearing to derive from this hearth feature. Around the north, south and west sides of the oven a substantial clay, brick and stone packing was erected, for insulation and protection. Both hearth features in Trench A appear to be contemporaneous. Each was built over an underlying, mixed deposit of cultural material, which yielded substantial quantities of broken glass, ceramics and iron. This deposit in turn overlay the natural clay, and may have resulted from general domestic discard in the area prior to the construction of the buildings, or have been used as a levelling deposit to fill an uneven surface. A 1913 halfpenny recovered from the deposit stratigraphically below the hearth features supports their post-1913 construction.

Trench B was located towards the western extremity of Henry's Mill, approximately 70 metres from Trench A, and immediately south of a very large, sprawling hydrangea. The three main surface features identifiable were a 60 cm high mound of brick and stone to the north-west, a two metre long alignment of small river cobbles, and a further mound of clay and stone to the south-east. Surface artefacts included broken bottle glass, a short length of iron rail, and several rusted, cast iron stove components.

Excavation of the mound in the north-western corner of Trench B exposed a substantial brick, stone and clay structure. Although it had been subject to distortion by the growth of two large trees, its primary characteristics remained discernible. Oriented east-west, a one metre long 'wall' of mortared, bonded brick was preserved up to seven courses in height and two courses in width. North of this wall was a probable brick platform, consisting of at least three to four rows of bricks, two courses high. Abutting the south of this brick construction was a packing of yellowish-brown, compact clay, into which were set large stones forming a loose border. The remains of several burnt floorboards up to 25 cm long were also revealed east of the structure, embedded between tree roots. From one board a small fragment of lino was recovered. These features together suggest the remains of a substantial hearth structure, oriented to the north-east, with a brick platform and backing wall.

Excavation of the clay and stone mound in the south-east corner of Trench B revealed a more intact hearth feature. Behind the neat brick structure was a packing of clay and stone, with a single strip of wood, one metre in length, framing its southern edge. Unusually, a concentration of artefacts associated with children were recovered from the fill within the structure, including a spinning-game piece, a tea-set saucer, a small ceramic figurine and a piece of lined slate. A range of cast iron stove components scattered on the surface nearby, including front and top plates and flue pieces, suggests that this feature probably functioned as a kitchen oven foundation. The clay and stone packing to the rear may also have formed the foundation for a chimney.



Figure 4: Brick hearth enclosure, Trench B

The south-western corner of Trench B was dominated by an L-shaped alignment of stones, consisting of a single-coursed, double row of small river pebbles 3.2 metres in length. Its relationship to the brick and clay hearth features nearby is uncertain, but it may have functioned as a garden border behind the house, or have been related to a possible rear verandah or similar shelter over an external doorway.

Trench E was established 15 metres to the west of Trench A, with a surface dominated by two low mounds of gritty clay, from which were eroding to show bricks, stones and several lengths of iron rail. Four mature tree ferns provided a substantial canopy over the surface features. Removal of surface rubble from the northern mound revealed the structural remains of an open fireplace. A rectangular bed of clay, 1.2 x 1.6 metres across, was set in a wooden frame, built directly over the natural clay below. Burnt traces of the wooden frame survived on the north and east sides of the clay bed. The sides of the fireplace were constructed of flat stones and half-bricks, packed with clay mortar, while the remaining open side faced south-east. A fire bar, evidently reused from a boiler in the industrial part of the site, was set upright in clay at the rear of the fireplace, apparently as a structural support.

Excavation of the southern mound in Trench E exposed another squared clay platform, framed with timber. Several metal plates erected on top of this platform, along with the remains of clay and brick packing and several discarded stove components nearby, indicate the likely function of this feature as another oven foundation. A layer of charcoal extended throughout much of the trench, along with numerous nails and three carbonised floor stumps, appearing to be the remains of a wooden floor which originally related to both hearth features.

### Conclusion

As expected in a sawmill settlement, houses at Henry's Mill were constructed predominantly from timber. In the absence of kiln or lengthy air drying, such green timber was liable to rapid warping, splitting and shrinkage. The weight of documentary, photographic and archaeological evidence suggests that roofs were generally made from split shingles, walls from split or sawn weatherboards, and floors from roughly sawn timbers, nailed onto low joists and stumps. Wire nails were cheaply available by the turn of the century, and were recovered in large quantities during excavation. Corrugated iron or sheet metal may also have been incorporated in some instances, to renew leaking timber roofs, and to provide a more fire resistant lining to chimneys. The limited quantities of window glass recovered support the presence of small, panelled windows in dwellings.

Considerable effort was clearly made by residents of Henry's Mill to construct substantial fireplaces and oven foundations, providing durable furnishings in response to a generally cold and wet local environment. Iron cooking stoves had become increasingly popular in Australia since the 1850s, with colonial ovens incorporated into large open fireplaces. By the early twentieth century, wood fuel stoves had become reduced in size, with a growing market to supply smaller families and households (Murphy 1985: 236-8). Operating on the principal of absorbing all of the heat before it disappeared up the chimney, cast iron kitchen stoves were often preferred for their relative cheapness, utility, cleanliness and efficiency. While catalogues from around the turn of the century promoted a great range of sizes and styles, prices for basic models started from around £4, roughly equivalent to a working man's weekly wage, while more elaborate models, featuring plate warmers and hot water fittings, cost up to £25 (e.g. Lassetter 1902: 231-40). The remains of cast iron stoves scattered on the surface of the site indicate the investment made in heating and cooking facilities, in response to the climate and location. These stoves, once installed, were also packed behind and to the sides with a thick deposit of clay and stone, to provide additional protection and insulation.

The local climate also appears to have had a significant impact upon the health of mill workers and residents, who would have been especially susceptible to bronchial and other infections. Fragments of numerous patent medicine bottles were recovered during excavation, including Morse's Indian Root Pills, D.B. Jenner's Cough Balsam, Wood's Great Peppermint Cure for Coughs and Colds, California Fig Syrup, and Kruse's Prize Medal Magnesia, along with Joseph Bosisto's eucalyptus oil. These remains point to the willingness of some residents to seek expedient remedies for illnesses in the absence of local medical treatment. Communities in the area were also prepared to fund the service of bush nurses, as substitutes for medical doctors.

Ensuring adequate supplies of clean water was also a challenge at times. Water tanks were the preferred arrangement for collecting supplies of drinking water. The school was equipped with a 600 gallon [2700 litres] rain water tank, although some people living nearby were in the habit of stealing its contents for washing

purposes (VPRS 640, 2328). Water for domestic consumption was only taken from the river as a last resort, as water reaching the mill settlement from upstream appears to have been contaminated from domestic or industrial waste, especially sawdust.

Forest-based industries were also infamous for the injuries sustained in all aspects of timber-getting. Workers were at risk from falling trees and branches, slipped axes, spinning saw blades, exploding boilers, tramway derailments and bridge collapses. Henry's was not immune to these industrial accidents. Daniel Scott was killed in 1907, when he fell under the wheels of a loaded timber truck which had run out of control (Colac Herald 19 Jul. 1907). In the same year, Arthur Blair had his arm cut off at the mill, while W.R. Henry, the mill proprietor, suffered a badly crushed foot after a timber truck on which he was seated was derailed (Colac Herald 16 Jun. 1913). Another worker, A. Battye, had his leg severely crushed by a log, and C. Ford had the top of one of his fingers sawn off (Colac Herald 26 May 1909). Children were also at risk. Young Thomas McGlone was severely burnt after falling onto a burning sawdust heap at the mill (Birregurra Times 23 Jul. 1918). More generally, floods in winter and bushfires in summer were a constant threat. The nearest hospital was at Colac, around 60 kilometres away by tram and railway.

Excavation of house and hearth remains at Henry's Mill also provide evidence for the movement, reuse and recycling of materials at the site. Fragments of beer and wine bottles, for example, showed evidence of having been cut down into storage jars. A heated wire was placed over the shoulder of the bottle, and the neck and finish were removed, resulting in a cheap, functional glass jar (Stuart 1993). Timber tramway studies indicate the frequency with which sawmill machinery was sold from one user to the next. Due to the capital expense of such items as boilers, saw frames, steam engines, winches, locomotives and steel rails, such plant was often purchased second, third or fourth hand, and pressed into service once more. Similar processes operated in the residential part of the site. Iron rails, for example, possibly salvaged after fires or floods, were cut to length, bent into shape, and built into hearths as supporting elements. The rails themselves were also of varying weights and profiles, indicating diverse origins before their use in and around the mill. The secondary use of a fire bar from a boiler in an open fireplace in Trench E is an example of an artefact removed from its primary industrial context and reincorporated into a domestic context, without undergoing extensive modification.

Bricks from a range of manufacturers and sources were also recovered during excavation of residential cottages, found both scattered on the surface and built into hearth structures. Examples included bricks from the Hoffman, Knights, and South Yarra AG & FB brickworks. Bricks appear to have been brought to the site on a fairly limited and piecemeal basis. The school committee, for example, requested 100 bricks in 1913 to repair the back of the school fireplace (VPRS 795, 2812). A number of Gartcraig firebricks, originally from West Ayrshire in Scotland, also found their way to Henry's Mill, presumably arriving in Australian ports as ballast in the holds of ships, in demand locally by foundries and bakeries

(Gemmell 1986: 56). Knights bricks came from Lal Lal, south-east of Ballarat, but must have been in circulation for some years before being brought to the mill, as the brick company went out of business in 1898 (Jack and Cremin 1994: 62). Surface finds at other Victorian mills contemporary with Henry's indicate a similar diversity of brick origins.

The opportunistic use of materials by residents at Henry's Mill is thus evident in the clay, brick, stone, wood and iron incorporated into the fabric of their dwellings and furnishings. There was no shortage of timber available at a sawmill, whether for building or firewood, while stones could be easily removed from the river bed. Bricks, including half bricks, were scavenged from wherever possible, and odd bits of machinery iron ended their productive lives as part of domestic fireplaces. Residents adopted a practical and thrifty approach to dealing with their environment, utilising materials available locally and naturally whenever possible, and expediently adapting manufactured materials into domestic structures. While accommodating and adapting to local circumstances, however, attempts were also made to modify the immediate environment, and provide some relief from the monotony of grey skies and scrubby forest regrowth. The planting and subsequent growth to maturity of exotic pines, oaks and various shrubs testify to the desire of mill residents to modify the local landscape, and create a sense of place in their isolated forest setting.

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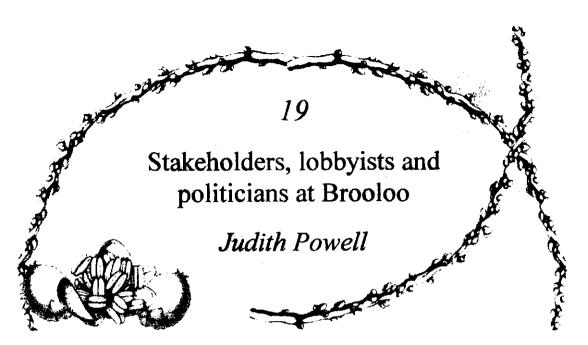
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It has been noted that, 'no other Australian sector has been so ridden with environmental conflicts for so long as the forests'. This is particularly the case given the high degree of publicity surrounding recent Regional Forest Agreements in various States in Australia. A series of them have been underway since 1992 and a number have been finalised. Each aims to determine the future use of the forest estate, balancing the competing interests of various 'stakeholders' (conservationists, the timber industry, bee-keepers, timber workers, and others) and at the same time maintaining ecologically sustainable forest management. Assessments of environmental, economic and social values are supposed to determine final decision making. Nevertheless, conflicts are nothing new to forest histories.

All histories are stories, and all stories have their elements of drama. If the Agreements have been theatre—whether tragedy or farce—then a single file in the Queensland State Archives outlines events worthy of a historical mini-series. In particular, the file, although incomplete, allows us to hear the characters speak their parts.<sup>2</sup> Between 1909 and 1915, the Brooloo State Forest near Gympie was the focus of intense debate. Forestry officials, small and large sawmilling interests, local business people and politicians were all involved in arguments concerning the timing and extent of access to the forests in Brooloo. As with the current Regional Forest Agreements, competing interests, political lobbying and bureaucratic advice all played a part in unfolding events.

There were six main characters in the mini-drama which unfolded:

## J. Henry Hancock, of the large timber company, Hancock & Gore Ltd

The Hancock family began in the timber industry in 1868, having arrived in Australia in 1856. Poor returns from farming led to Josias and Thomas Hancock leaving for the Gympie goldfields. Timber proved a more lucrative enterprise than

gold mining: gold was unpredictable at best; timber was regularly needed for props and other construction. The partnership broke up in the 1880s, and Josias went on to establish a timber business in Brisbane that by the late 1920s was the largest timber business in Australia.<sup>3</sup>

## Philip MacMahon, Director of Forests from 1905 until his death in 1910

Born in Dublin in 1857, he became a student at Kew Gardens under Sir Joseph Hooker and was appointed curator of the Botanic Gardens in Hull (Yorkshire) at the age of 24. On arrival in Australia in 1888, he worked as a journalist in Melbourne until a meeting with Sir Thomas McIlwraith led to an offer to organise a forestry department in Queensland. The appointment did not proceed and he went on to become Director of the Botanic Gardens until finally appointed as Director of Forests in 1905. Professional forestry in Queensland began with his appointment; his book on the merchantable timbers of Queensland indicates his concern for the economic dimension of forestry.

### Harry Walker, MLA

Born in Gympie in 1873, educated locally, former miner and engine driver, Harry Walker joined the Light Horse Jubilee Contingent and served in the Boer War in 1899. He farmed at Coles Creek and Tewantin and from 1906 until 1932 was a Director of the Wide Bay Co-operative Dairy Company. He was the Country Party MLA for Wide Bay from 1907-1912 and for Cooroora from 1912-1947. Harry Walker was, above all, a local member: although he served as Secretary for Agriculture and Stock between 1929 and 1932, far more important were his local duties. The Gympie Times records his attendance at Progress Association meetings at Kandanga and at official openings of the school at Imbil and the Mary Valley show.

### **Andrew Doyle**

One of eleven children, 'Buller' Doyle was born during his parents' journey by bullock wagon from Condamine to Woodford in 1875. Andrew and two brothers, John and James, worked in the timber industry in the Mary Valley. John Doyle had established a mill at Kandanga by 1904 and Andrew established a mill at Kin Kin<sup>7</sup>. His move to Brooloo is the subject of this paper.

# N.W. Jolly, Director of Forests from 1911-1918

Jolly was the first trained forester to be responsible for the State's public forests. He had studied at Oxford under Sir William Schlich, who had established the two principles of forestry, namely the need to establish an annual cut on the basis of the size of the forest, the population of tree species, their size and growth rate; and the need for regeneration.<sup>8</sup>

### David Lahey

The Lahey family arrived in Moreton Bay in 1862<sup>9</sup>. The youngest of eleven children, David Lahey constructed a timber mill in the Canungra district in 1884. By 1907, there were 350 people living in the district, most of whom were dependent on the mill. In 1910 Lahey formed Brisbane Timbers Ltd. In 1907 the

Tamborine Shire Council had advocated the creation of a reserve at Witch's Falls within the Shire boundaries. David Lahey was one of the backers of the move which led to it becoming Queensland's first National Park in 1908. The distinguished conservationist, Alec Chisholm said of David Lahey that he was 'a timber miller and merchant. Yet he was by no means a destroyer; he greatly admired the rainforests above his headquarters at Canungra and wanted to see them preserved' <sup>10</sup> His son, Romeo Lahey, was the first President of the National Parks Association of Queensland.

# Setting

In 1900 a Forestry Branch was created within the Department of Public Lands. It had a staff of three. Its presence within the department responsible for expanding settlement had inherent contradictions, as MacMahon noted:

It is an unfortunate circumstance, from the standpoint of forestry, that the State's best soft woods are found on its best soils. The maintenance of the rich volcanic coastal scrubs as permanent reservations for forestry purposes cannot be regarded as a subject for serious consideration. The demand for such land for close settlement became more pressing and each year sees additional areas of such land as the timber becomes cut out, excised from the reservations and opened for settlement.<sup>11</sup>

In 1906, there were 333 timber contracts operational within the whole of Queensland, of which 100 were based around Gympie. 12

In 1907, 41,678 acres [16,867 ha] were declared as State Forest Reserve 135, Brooloo. About 40 per cent of the declared area was 'jungle' or 'scrub', more valuable than the 'parkland' that constituted the remaining 60 per cent. Further reservations were made until, in the 1930s, the total area of State Forest and Timber Reserve was 135,326 acres [54,765 ha], forming a more or less continuous belt along the western side of the Mary River.<sup>13</sup>

# Act 1—Opening moves

Between November 1908 and January 1910, an application was made, accepted, rejected and modified to open around 1700 acres of Brooloo SF 135. Large and small timber interests, local settlers and Gympie businessmen all vied for political influence, and their competing interests, rather than any advice from the Director of Forestry, appears to have influenced decision-making.

In November 1908, J. Henry Hancock of Hancock and Gore approached the Under Secretary of Lands with an application to cut timber on 3000 acres [1214 ha] of Reserve 283 in the Blackbutt Range near Moore. The company had two mills, but timber for their sawmill at Darlington on the Albert River was exhausted and they were looking for supplies elsewhere. A regular and adequate supply within their control was essential; on the Albert River they had no timber in their own name and were at the mercy of teamsters who owned timber but 'only

worked when they thought fit'. By January the company was writing to the Minister for Lands:

we beg to inform you that we have now closed our Darlington Mill and are removing the machinery therefrom. We have been hoping to hear from you. It is immaterial to us which district is apportioned to us, either Colinton or Brooloo, but it is very important to us that we should get to work somewhere.<sup>14</sup>

In a memo dated 3 February 1909, MacMahon noted that an application for access to Brooloo timber would be favourably received and the company duly wrote to the Under Secretary for Lands asking for access to 2000 acres [809 ha] of Brooloo, the area being marked on an attached map. MacMahon sent a memo to the Gympie Land Agent and the District Forest Inspector, Gilbert Bennett made an inspection, reporting that of the 1700 acres [688 ha] to be put up for sale by tender, 100-200 acres [4080 ha] was 'thickly covered with pine trees'. Transport was not readily available, the nearest rail head being at Cooran 22 miles away or 30 miles by a better road [35 or 48 km] to Gympie. Clearly, as MacMahon noted, the value of the timber would be significantly increased when the rail line planned from Gympie to the Mary Valley was completed.

Hancock & Gore wanted access to the Brooloo timber without competition. They argued that 'the system of calling for tenders (especially in some localities) renders the chance of the tenderer who really intends to manufacture the timber, very precarious'.

It may have been 'immaterial' to Hancock & Gore whether or not they moved their mill to Colinton or Brooloo, but it certainly wasn't to local timber interests. A petition went to the Minister for Lands:

We the undersigned timber getters of Woondum & district protest against the sale of any large block of timber to any one firm or person, & join with the other associations protesting against the proposed sale by auction of 9,000,000 ft [27,000 m<sup>3</sup>] of pine in the Brooloo Reserve as proposed by the Department.<sup>15</sup>

The letter was signed by eight men; another letter from Gympie was signed by a further 29 men, and a meeting at Bunya Creek bewailed that 'it gives us timbergetters no chance of selling timber if they obtain large blocks and keep them on hand'.

MacMahon recognised the need for continuity of supply but saw that a struggle between timber-getters and sawmillers would play into the hands of timber importers. Small allocations of timber, he argued, would not keep mills going and he foresaw the increasing demands that such allocations would create. Nonetheless, the debate was a political one and a meeting at Brooloo was attended by, amongst others, the Minister for Lands, Mr Denham, and the local member, Harry Walker. Although the Forestry Department had estimated that reserves were less than those calculated by the timber merchants, the Minister for Lands was reported by the Brisbane Courier as inclined to believe the larger calculation of the timber merchants, namely that the reserves had an estimated 400,000,000 super feet [1.2 million m³] of pine. <sup>16</sup> A memo from MacMahon two days later

notes that the reported estimate of 9,600 super feet per acre [71 m³ per ha] was quite unlikely to be true and in any case much of the country contained hardwood and not pine. Nonetheless, the decision to release the land as a single block was reversed. Smaller blocks (of around 250,000 super feet [750 m³] each) were to be released one at a time, as the timber on each was exhausted.

Hancock and Gore withdrew; 250,000 super feet would only last about two months cutting even for a small mill and they didn't want to be at the mercy of teamsters. The large millers agreed. In a letter from the Associated Timber Merchants to the Minister for Lands, they complain:

the effect (whatever may be the intention) of the Government, is to place the Sawmiller—who has to run all the risks—entirely at the mercy of the teamster, who has none...The members of the trade interested cannot understand why the Government would wish to deal so serious a blow to a trade which has many difficulties to contend with, and a feeling of strong indignation upon the matter exists. They feel they are deliberately sacrificed for the benefit of those who have not one atom of claim, & who desire the timber for purposes not so legitimate, or so desirable in the interests of the country.<sup>17</sup>

MacMahon understood the conflicting interests of the large and small millers and had recommended that two separate areas be made available:

my recommendation that one area near Gympie should be devoted to timbergetters and an equal area or thereabouts offered in two lots to suit millers was an endeavour to meet the wishes of both parties; choosing the more easily accessible place for the timber-getters, and for the millers a place where they would have to spend money on roads.<sup>18</sup>

Further interest groups made their views known. The Gympie Chamber of Commerce and Mines wrote to the Minister for Lands:

The Government should first cater for the bona fide settlers who were making their homes in the district, and disposing of the timber at the present time they were doing away with one of the main incentives for the construction of the railway.<sup>19</sup>

At Imbil, the Committee for the Mary River Valley Railway League expressed similar views:

at a public meeting of Mary Valley settlers it was unanimously carried to protest against any timber being sold on the Brooloo Reserve at present or until the proposed railway is an accomplished fact.<sup>20</sup>

In September 1909 the 1700 acres [688 ha] that Hancock & Gore had applied for had been marked off as 23 blocks but on the 10th January the next year, partly no doubt in response to pressure from locals, the blocks were withheld from sale until the opening of the proposed Mary Valley rail line.

## Act 2—The plot thickens

Despite the decision to delay the opening of the Brooloo State Forest until the advent of the Mary Valley railway (which would make the timber more valuable and would add significant freight revenue) representations by member for Wide Bay, Harry Walker, led to the policy of slow release of small blocks of timber in order to provide continuing employment for local timber-getters. The results of this were to progressively release amounts of forest comparable in total to the single large release rejected earlier.

At the end of November 1909, Andrew Doyle wrote to his local member:

Dear Harry,

I have shifted my sawmill from Kin Kin to the Bluff & am now prepared to work a block of timber there. Kindly do your best to secure me a block of timber without competition at the ruling price in the District...I am going to considerable expense in erecting a fair little mill & installing a new Boiler, and I think I should be entitled to a Block without any competition, and I respectfully ask your urgent & earnest influence in my behalf in that particular matter. If you cannot get satisfaction from the Departmental officials, perhaps if you have a quite [sic] word with the Minister for Lands himself & place the matter thoroughly before him ... I would like as large a Block as it is possible to get, as I shall be employing about 5 or 6 men when I get a start on. Kindly get this through for me as soon as possible, as I wish to keep my team working on logs to Traveston until I get the mill erected.<sup>21</sup>

The local member sprang into action. In February, the Under Secretary for Lands wrote to Harry Walker noting that the Crown Lands Ranger had arranged with Doyle to mark off the block he required. Andrew's brother, John, then wrote to the Director of Forests along similar lines:

Having the erection of my saw mill on Yabba Creek near its completion I wish to know if I can acquire a pine timber block on the Brooloo State Forest about 1½ miles [2.4 km] south of my mill site.<sup>22</sup>

The assurance of opening a mill before access to pine had been obtained speaks volumes! John Doyle later wrote noting that his mill would put through 100,000 ft [300 m³] a month, giving support (indirectly) to Hancock & Gore's earlier complaints that a block of 250,000 ft would not support a mill beyond around twomonths, and therefore not be viable.

More applications for timber were passed to the Director of Forests by Harry Walker. Each was small and Walker urged that they be supported. The Under Secretary for Lands asked the Land Commissioner in Gympie for further details, especially concerning the number of timber workers involved. MacMahon asked him further to investigate 'the best manner in which the reasonable requirements of timber-getters in the vicinity of Brooloo State Forest could be met without trenching too extensively on the State Forest'.

The effect of this slow release of small blocks became apparent quickly. Doyle wrote to the Minister for Lands on 17 July 1911:

My mill is being hung up for want of timber to keep it going, my present block being worked out. Will you kindly grant me the privilege to chose [sic] for another block of pine immediately, otherwise I shall be obliged to close my mill down for want of timber supply and put several men out of work...I am the first man to erect a sawmill in the Brooloo district & I should very much like to chose for another block as I had for the last one of say 500,000 ft [1500 m³] so as I should have something secure & permanent to work on.<sup>23</sup>

It was arranged that seven blocks in Brooloo State Forest would be put up for sale. The blocks were small—from 50,000 to 125,000 ft [150-375 m³] each—and Andrew Doyle, for one, complained at the size. He applied for three blocks, but the Gympie Land Agent recommended against this, noting that:

the offering for sale of seven timber blocks in Brooloo State Forest was arranged with a view to keep the local timbermen supplied until the completion of the Mary Valley railway, before which date it was considered undesirable to further operate on the State Forests.<sup>24</sup>

On 6th September 1911, seven blocks of pine were offered for sale on SF 135. In December 1910, MacMahon died suddenly and was succeeded by N.W. Jolly. From 1911, Jolly attempted to regulate the release of timber blocks. He was partly successful, although earlier decisions had created a momentum that was difficult to withstand. At the beginning of 1912, Andrew Doyle was again writing to Harry Walker:

I again ask your assistance to secure me another timber block at the Bluff. My old block is worked out and I shall have to close down operations till I can secure more timber. I should like to secure a block of about 500,000 ft [1500m<sup>3</sup>]...You might confer with the Minister for Lands in my behalf...<sup>25</sup>

Some of the problems foreseen by MacMahon now came to light. Accessibility for example. Of the seven blocks that had been offered for auction, two remained unsold and one was forfeited. These were offered to Andrew Doyle, but his response indicated that:

the blocks mentioned I could not purchase, as there was no way of removing the timber excepting through private property from which I was excluded even by offering a consideration to the owner for the privilege of letting me haul the timber through.<sup>26</sup>

A further offer of a block of pine was rejected as it would have been impossible to haul logs across the range. Jolly finally agreed that Doyle could choose a block of 100,000 super feet [300 m³] on the proviso that 'he should avail himself of the opportunity to purchase log timber from teamsters in the open market if he desires to keep his mill at full pressure'. On 8 May 1912, Andrew Doyle wrote again:

Dear Harry,

I am again going to worry you for timber. I have written to the Director of Forests today to allow 250,000 block to be marked for me...and will you kindly confer with him in my behalf to allow the block to be marked as quickly as possible. I will show the ranger where I wish to have the block

marked. Please have the above sized block marked as any less is not much use to a mill after cutting roads to it. Kindly urge this matter on as my teams are also idle and I am loosing [sic] good weather.<sup>27</sup>

The letter is annotated a week later: 'will offer this for sale under the special circumstances but only on the understanding that no further request will be entertained'. The precedent was set, it seems, and more applications came in—including from a D. Lane, who applied for land that, interestingly, had been forfeited by Doyle. Lane had made an agreement with the owner of the land through which transport had been refused to Doyle, but his application was turned down. More applications (supported by Harry Walker) came in and Jolly prepared a detailed memo for the Minister (18 July 1912). Disingenuously he noted:

Seeing that the decision to withhold Brooloo timber from sale pending completion of Mary Valley line was not adhered to on account of timbergetters then established I presume that it was intended to provide new blocks for them as the old ones were completed.<sup>29</sup>

In the meantime Andrew Doyle had written yet more letters. In one to the Under Secretary for Public Lands, he asked for the return of half his deposit money paid on a timber block he had then forfeited; two months later he wrote back thanking the Under Secretary for the money, but asking now for the full deposit to be refunded: 'I assure you it is costing me a lot of work & expense to open a road into my present block through swampy ground'. 30

Harry continued his representations. T. Rodwell of Brooloo wrote to him in October:

I called at your place this morning but you were away. Will you try and get that block for me I am shut down waiting for timber. Mr A. Doyle got permission to go and cut away at the block he got until it was put up at auction. Will you try and get me the same concession?<sup>31</sup>

By the end of 1912, Jolly was attempting to put some order into matters, noting that 'when the time comes to deal with the Brooloo timber the area, being a State Forest, will be worked according to a definite plan'. <sup>32</sup> In a series of memos written in January 1913, Jolly outlined the issues:

There is no reason why the applicant—or any other individual—should not build a mill wherever he may choose, but is the erection of these new mills to influence the question of conserving the timber supply? In this connection I might mention that I was waited on recently by a representative of one of the oldest mills in Brisbane which—he states—is now in want of timber owing to the fact that the supply is to a large extent monopolised by the numerous country mills...the fact is mentioned here only to show that there are conflicting mill interests quite apart from the clash with Forestry interests. As I have pointed out previously, Forestry demands that the quantity of timber extracted from a reserve annually should not exceed the annual growth, and should be independent of demands from timber-getters and sawmillers. Many years will elapse before sufficient information will have been gathered to enable foresters to determine what that quantity will be for

any reserve, but the number of cut and abandoned reserves shows that it has been greatly exceeded in the past.<sup>33</sup>

A fortnight later, Jolly responded to further requests for sale of pine in Brooloo State Forest and outlined the background to the current situation:

On 10.1.[19]11 Mr Denham, then Minister for Lands, acting on the advice of the late Director withdrew all timber on Brooloo from sale pending the completion of the Mary Valley Railway...Later Mr H.F. Walker, M.L.A., represented that this action entailed the throwing out of work of several teamsters, and advocated the sale of a few blocks. He explained that owing to the distance to the nearest station a team could not remove more than about 100,000 ft [300 m<sup>3</sup>]per year...The Minister on 11.5.[19]11 authorised the sale of 7 small blocks in favour of 6 teamsters who were engaged at the time on adjacent freehold lands and it has since been approved to continue to make timber on the State Forest available for timber-getters... The position is now somewhat complicated as at the beginning of 1911 two sawmills were in course of erection by J. and A. Doyle respectively and since that date two more mills have been erected by timber-getters... I consider that the concession granted by the Minister in favour of the small teamsters was not intended to develop into anything larger, but, if we are to continue making sales as the 'established timber-getters' desire, it is obvious that it must mean much more extensive working. Applications from old established sawmillers to purchase large blocks on Brooloo were not entertained and there is no reason why these new mills should be treated differently... I would point out that the Brooloo State Forests as a State Forest was intended to provide a regular and never-failing supply of timber and should be managed with that end in view. This means that the sales of timber and every other matter affecting its management are to be regulated according to well thought out plans of working and are to be independent of the desires or interests of timber-getters and sawmillers. It is extremely important that this point be realised now while there is still a chance to prevent the growth of vested interests...The general impression seems to be that the opening of the Mary Valley Line is to be the prelude to the exploitation of the State Forest by sawmillers and timber getters, but the sooner the idea is dispelled the better...A lengthy inspection of Brooloo by Inspector Lawrence resulted in the mature pine being estimated at about 40,000,000 sup.ft. [120,000 m<sup>3</sup>] but as Mr Lawrence was working singlehanded he expects that a fresh inspection would disclose the existence of 60,000,000 ft. [180,000 m<sup>3</sup>] On the basis of the latter figure this annual removal permissible should certainly not exceed 3,000,000 ft. [9000 m<sup>3</sup>] and I am convinced that even this is excessive. No greater quantity should be removed per annum whether the Railway line is opened or not, and, as this quantity should be provided every year, there is very little to be gained in this way by delaying working till the opening of the line—i.e. if Forestry is to be practised at all. To my mind the main reasons for holding Brooloo back are the want of an approved plan of working and the fact that the market is fully supplied from other reserves which are being greatly overcut...[Jolly went on to outline plans to develop working plans for the forest] Only in this way can any system be introduced into the work of the Forestry Branch, for it cannot be too strongly urged that the plans are not to be affected by pressure from outside [original underlined].<sup>34</sup>

Jolly fought in vain to retain some semblance of control and planning in the exploitation of the Brooloo forest. But the vested interests were great, and political lobbying continued. Andrew Petrie supported a request by the timber merchant, T. Marsden to have access to Crown timber after he built his sawmill at Imbil at the beginning of 1915. As Jolly remarked, 'the writers, having no private supplies of pine and no agreements with the Department, erected a mill in a locality where previous applications had been consistently refused.' Harry Walker continued to represent local interests, receiving deputations of sawmillers who complained at the lack of access to timber and delays in timber sales. Andrew Doyle bemoaned to Harry that 'it is no good having a fat team of horses idle in fine weather'. 35

In April 1915 *The Gympie Times* reported on proposed sales of 15 blocks of timber. Despite Jolly's memo concerning the maximum annual cut that would be acceptable, the paper reported that the Forestry Department planned to make 4,500,000 ft [13,500 m<sup>3</sup>]of timber from Brooloo available annually. In any case, disregarding Forestry advice, they noted:

it was estimated that there was 250,000,000 ft [750,000 m³]of timber on the reserve so it would take 60 years to cut out...there was good land there too but at the rate named, it would not be available in their children's children's time.<sup>36</sup>

Once again, local concerns led to the fifteen blocks being reduced in size, in order to accommodate the interests of small, local timber-getters and millers. Jolly warned against such a decision, arguing that:

doubling the number of blocks and halving the quantities would mean a rush of teamsters to the locality and they would probably remove the total quantity sold in six months at most. Then there would be a tremendous clamour for further sales, with the result that either the teamsters would be forced to keep off the reserve for 6 months or else their clamour would be yielded to, thus doubling the rate of cutting and exhausting the timber supplies in a very few years. [He concluded] I cannot see that there is any justification for national interests to be subordinated to petty local desires, and strongly recommend that this request not be granted.<sup>37</sup>

A meeting at Gympie was addressed by Harry Walker:

He [Harry Walker] had a great deal of trouble in the Lands Department as regards timber and he had no hesitation in saying since the Forestry Department had taken over dealing with the State timber, the trouble in getting the timber made available had increased tenfold. Their big trouble was getting the timber thrown open as required, and also the large size of the blocks. They were too large altogether. Blocks containing 150,000 ft [450m³]were sufficiently large. 38

The fifteen blocks were reduced in size. When the results of timber sales were published, however, it was clear that the concerns about the size of timber block

had been exaggerated. Most buyers bought a number of blocks: the Bluff Timber Company bought 4 blocks (a total of 500,000 super feet [1500 m³]), John Doyle bought two blocks (a total of 450,000 super feet [1350m³]) and Andrew Doyle bought two blocks (a total of 300,000 super feet[900 m³]).

But back to the railway issue. It was the prospect of the railway (and of freight charges on timber, and of the increased value of timber close to a rail line) that had influenced Denham's decision to 'close' the Brooloo State Forest in 1910. A meeting in Gympie was addressed by Councillors Mulcahy and Skyring:

If they were going to make it a paying line, much more timber should be made available and it was time the guarantors, the Gympie City Council and the Widgee Shire Council took action. [Cr Mulcahy moved and Cr Skyring seconded that] the City Council, Chamber of Commerce, Timbergetters' Association and the members for Cooroora and Gympie be requested to cooperate to get more timber available.<sup>39</sup>

In response to a deputation concerned with timber sales in Brooloo, Jolly again tried to argue logically for a planned approach to the issue:

To yield to the popular clamour for more blocks now means practically to encourage forest exploitation and to prohibit correct forest management, and it is of vital importance to Forestry in Queensland that the principle of regulating the yield of a reserve be established.<sup>40</sup>

#### His frustration was clear:

This district has fought every change which has been made in the interests of the State[and] has consistently maintained its attitude of harassing the administration. Forestry, which exists for the State for all time, unfortunately cannot please the individual or even the present community...Practically the whole of the staff is engaged solely in dealing with the public and there is no timber left for Forestry.<sup>41</sup>

No wonder Forestry, despite the logic of the arguments, lost the public relations war!

Nonetheless, Jolly had raised important issues and they came to have a greater public airing. In the *Brisbane Daily Mail*, articles on 'Our valuable forests' and on 'Forest Preservation' appeared in June, although Jolly clearly thought the journalist was an 'armchair forester' without any real understanding of the subject. <sup>42</sup> The newspaper's calls for the development of plantations was at odds with Jolly's preference for a scientific approach to mature forests and the development of sustainable cutting rates in native forests.

# Act 3—Finale

On 22 June 1915, the Managing Director of Brisbane Timber Ltd, David Lahey, wrote to the Minister for Lands:

We congratulate you on the position you took with regard to the attempt to induce you to authorise the slaughter of the pine in the Brooloo scrub and also on the suggestion that part of the timber royalty be donated to reaffore-

station. It seems to us this subject should have been grappled with long since. The writer is anxious to try it on a small scale at Canungra on the lines indicated in a conversation some months ago with Mr Jolly of your department.<sup>43</sup>

How ironic that the earliest successful trials occurred in the Mary Valley, where attempts to support small local loggers and millers (in order to maintain employment and a viable local industry) had ended in almost the same area of land being logged as had originally been applied for by Hancock & Gore. In due course, immense areas of 'scrub' were felled in order to develop hoop pine plantations in the Mary Valley.

When we visit the landscapes of the Imbil and Brooloo Forests, it is as well to remember the dramas played out in them which are responsible, in part, for their appearance today.

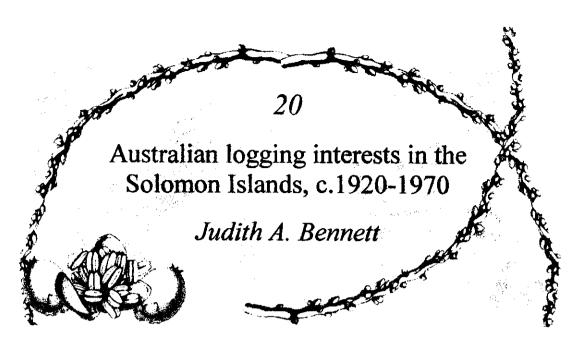
## Acknowledgement

I thank Joy King of Imbil and Elaine Brown of Coondoo for information on both Harry Walker and Andrew Doyle.

#### Notes

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- 3 E.S. Hancock 1969-70. The Queensland timber industry: early history and development. Journal of the Royal Historical Society of Queensland 9(1): 169-78.
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- 8 Peter Taylor 1994. Growing up: forestry in Queensland. Brisbane: Allen & Unwin: 55.
- 9 Details on David Lahey's life come from Shirley Lahey. 'David Lahey 1858-1942: his background and his life'. an article prepared for the Beaudesert Shire Council, 1996.
- 10 ibid.
- 11 quoted in L.T. Carron 1985. A history of forestry in Australia. Canberra: Australian National University Press, Canberra: 99. Indeed, by 1917, 73% of the State's log cut was from alienated forest lands, over which the forest authorities had no control (Kevin Frawley 1983. A history of forest and land management in Queensland with particular reference to the North Queensland rainforest. unpublished PhD thesis, Australian National University: 333.)
- 12 Annual Report of the Director of Forests for 1906: 10-11.
- 13 V. Grenning. General Working plan for Mary Valley, Working Plan Area 1928-9 and 19323.

- 14 Letter from Hancock & Gore to Hon. Minister for Lands, 14 January 1909. (QSA: LAN/AK 58)
- 15 Letters from Woondum timbergetters and from timber getters at meeting at Bunya Creek to Minister for Lands, c. 1 July 1909. (QSA: LAN/AK 58)
- 16 Brisbane Courier, 20 July, 1909.
- 17 Letter from Associated Timber Merchants to the Minister for Lands, 29 July 1909 (QSA: LAN/AK 58)
- 18 Memo from MacMahon to Under Secretary of Lands re 'Hancock & Gore Ltd.—further re timber blocks of 250,000 sup. feet on Brooloo State Forest', 6th August 1909 (QSA: LAN/AK 58).
- 19 Letter from Gympie Chamber of Commerce and Mines to Minister for Lands, 3 August 1909 (QSA: LAN/AK 58).
- 20 J.A. Somerville, Imbil, to Hon D.F. Denham, Minister for Lands, 10 August 1909 (QSA: LAN/AK 58).
- 21 A. Doyle to H.J. Walker, M.L.A., 30 November, 1909 (QSA: LAN/AK 58).
- 22 John Doyle, Saw and Planing Mills, Kandanga Creek to Director of Forests, 10 October 1910 (OSA: LAN/AK 58).
- 23 A. Doyle to Minister for Lands, 17 July 1911 (QSA: LAN/AK 58).
- 24 Memo from Gympie Land Agent's District re 'Application by A. Doyle for a block of pine', 20 July 1911 (QSA: LAN/AK 58).
- 25 Andrew Doyle to Mr H.J. Walker, 5 February 1912 (QSA: LAN/AK 58).
- 26 Andrew Doyle to Under Secretary, Department of Public Lands, 15 March 1912 (QSA: LAN/AK 58).
- 27 Andrew Doyle to H.J. Walker, M.L.A., 8 May 1912 (QSA: LAN/AK 58).
- 28 Annotation signed E.H.M, 15/5/12 (QSA: LAN/AK 58).
- 29 Memo (NWJ) re Brooloo State Forest, 18 July 1912 (OSA: LAN/AK 58).
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- 32 The working plan was not developed until 1928. V. Grenning, General working plan for Mary Valley 1928/9 to 1932/5, Forest Management Working Plans, DPI Forestry Library.
- 33 Memo from N.W. Jolly re 'Sale of pine timber on Brooloo State Forest' 24 January 1913 (QSA: LAN/AK 58).
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- 35 Andrew Doyle to H.J. Walker, M.L.A., 21st April 1915 (QSA: LAN/AK 58).
- 36 Gympie Times, 27 April, 1915.
- 37 Memo from N.W. Jolly re 'Brooloo State Forest deputation re sales of timber' 30 April 1915 (QSA: LAN/AK 58).
- 38 Gympie Times, 1st May 1915
- 39 Gympie Times, 1st June 1915.
- 40 Memo from N.W. Jolly re 'Proposed deputation re sales of timber on Brooloo State Forest' 4 June 1915 (QSA: LAN/AK 58).
- 41 Memo from N.W. Jolly re 'Proposed deputation re sales of timber on Brooloo State Forest' 4 June 1915 (QSA: LAN/AK 58).
- 42 Annotation (dated 26/6/15) by Jolly on article 'Our valuable forests' *Brisbane Daily Mail* Tuesday 22 1915 Memo from N.W. Jolly re 'Proposed deputation re sales of timber on Brooloo State Forest' 4 June 1915 (QSA: LAN/AK 58).
- 43 Letter from Managing Director of Brisbane Timbers, David Lahey to Minister for Lands 22 June 1915 Memo from N.W. Jolly re 'Proposed deputation re sales of timber on Brooloo State Forest' 4 June 1915 (QSA: LAN/AK 58).



In time, when they have been introduced to larger markets abroad, some of these beautiful hardwoods should prove a valuable asset 1

Walter Henry Lucas, 1910

From its beginning in 1896, the British administration of the Solomon Islands Protectorate encouraged the establishment of coconut plantations as the basis of a viable economy.<sup>2</sup> 'Opening-up' the land meant cutting down the forest. The first Resident Commissioner, C.M. Woodford, extolled its timbers and offered samples to English furniture makers in 1897.<sup>3</sup> Although the Solomons may have been a British Protectorate, Sydney dominated its trade. It was in Australia that a market would have to be found, if only because of the transport costs to Britain. The emerging dependence on Australia stimulated some interest there in logging, but it also left the Protectorate vulnerable to the vagaries of Australian trade policies and markets.

# Planters and loggers

The leading investors in plantations were Lever's Pacific Plantations, allied to the England-based soap manufacturer, and the Australian shipping and merchant company of Burns Philp. These were also the first companies which investigated the potential of Solomons timber. In 1908, as Lever's cleared land for planting, it shipped some of the logs to Sydney.<sup>4</sup> At its Balmain factory in Sydney, Lever's used these softwoods to manufacture soap boxes, but they caused the soap to discolour so the export ceased.<sup>5</sup>

Burns Philp's islands manager, Walter Henry Lucas followed Lever's lead. While inspecting company properties he noticed the potential of timber on Tetepare. In July 1908 he found along the north side:

Very fine timber was abundant on the low lands averaging three or four fine trees to the acre with trunks from 40 to 80 feet [12-24 m] to the lower forks and girthing 10 to 18 ft [3-5 m]. a few feet above the ground...thousands of fine trees are growing within a few hundred yards of the beach and could easily be cut and shipped at an absolutely nominal expense...<sup>7</sup>

Burns Philp sent a 'timber man' to examine the forest. His presence in the group awakened interest among planters clearing land, several approaching him to assess their timber. The company meanwhile tried the Australian market. Along with Lever's shipments, the total number of logs exported was about 500, valued at £1627, during the period 1907-09. The venture encountered opposition, however, from 'the combination existing between large timber firms in Sydney, to discourage everything but Australian timber. Burns Philp toyed with the idea of opening a sawmill in Sydney and even in the Solomons, but thought the tropical island timber trade too risky.

Though these large companies abandoned the idea, a small-time Australian planter in the Shortland Islands, Eric Monckton needed some way of earning cash while his coconuts came into bearing and in 1910 found a buyer in Sydney, the Island Timber Co. for the timber cleared from his land. He cut the dalo (Calophyllum spp. or Island Cedar) and later dafo (Terminalia Brassii or Swamp Oak) into 12-14 feet [3 m] lengths so they could fit in the hold of Burns Philp's six-weekly steamer. It was a low cost, low technology operation involving local labour and a bullock team on what was easy coastal terrain. It was adjacent to the steamer port and the government station where the district officer could ensure that Monckton paid the royalties and rental for the logging lease he had obtained for adjacent native-owned land in 1912. Monckton exported about 350,000 super feet [1053 m³] annually and earned about £1200 gross. Most of his logs ended up as 'coffins and cheap furniture' in Sydney.

The copra market collapsed as the Great Depression began so Monckton became even more dependent on his logging business. Even this was threatened when Australia imposed a tariff on imported logs. They were the only Protectorate product so taxed, and the rate jumped from 10 to 30 per cent *ad valorem* in June 1930. Strapped for cash he eked out a living from logging and subsisting on his land. Monckton's business got some relief in February 1933 when Australia recognised British Protectorates as eligible for 'empire preference' under the Ottawa agreement and reduced the import duty to 10 per cent plus 10 per cent primage. Heavily in debt to Burns Philp, he nonetheless continued exporting logs until the war with Japan engulfed the south Pacific. 18

Planters learned a lot about the forest as they cleared it. On Malaita, the plantation manager of the Malayta Company, Neil MacCrimmon, decided in 1923 to leave his job and set up as a trader and timber merchant. He took out leases on two acres [0.8 ha] at Su'u for his base and others to the south of 1000 acres [405 ha]. Trading as the Mala Timber Development Company, MacCrimmon and R. W. Jackson floated the logs to Su'u where the steamer called. Initially the logs, including dawa or mede (Pometia pinnata), found a market in Australia, encouraging MacCrimmon to bid for a lease of distant Tevai, near Vanikoro (also spelt as Vanikolo) where the valuable kauri (Agathis macrophylla) grew. However,

the Australian 'timber rings' moved against MacCrimmon to such an extent that the export business 'became a losing proposition' late in 1927.<sup>22</sup> The company turned to trading as well as starting

to cut and sell dressed timber at Su'u for local building purposes; ...this timber...is excellent. They have already received orders for their timber from local firms and plantations. They are employing a Chinese boatbuilder to make dinghies and whaleboats for the Europeans and the natives.<sup>23</sup>

The business survived until early 1930 when the contracts for hardwoods MacCrimmon anticipated in Australia fell victims of the Depression-driven increase in import duty.<sup>24</sup> MacCrimmon shut down his sawmill and in July 1930, sold it to equally unsuccessful partners and went to manage the Vanikoro Kauri Timber Company.<sup>25</sup>

## Vanikoro Kauri Timber Company

Monckton and MacCrimmon had been planters, but had diversified with mixed success into logging. Much the same could be said of Fairly, Rigby Co. Ltd too. 26 Resident Commissioner Woodford sought them out in 1913 to invest in logging on Vanikoro, one of the most isolated islands in the Protectorate where the people, so it appeared, were 'rapidly dying out'. 27 Woodford wanted to diversify the copra-dependent economy and find a way of extending a government presence, represented by a district officer, into the most easterly Santa Cruz district, mainly to prevent the illegal incursions of French labour recruiters and Japanese shell divers

The company inspected the island and applied for a license 'to cut, fell, and remove kauri timber' in October 1913.<sup>28</sup> Stretched for money, they recapitalised as San Cristoval Estates Ltd in 1916 and renewed their application, but the British Colonial Office postponed finalising it until a land claim by a New Hebrides-based French company had been settled. Since France was an ally during World War I, any contentious issues between Britain and France were put on hold.

At the end of the war, the Australian government looked to New Guinea and the Solomons for a source of timber for a massive house-building project for returned soldiers. J. T. Caldwell, representing a private syndicate, learned of the kauri on Vanikoro and visited the Protectorate. Passing himself off as lessee of the Vanikoro land to the Australian War Service Homes Commission, he sold them the lease for a substantial £50,000. Though considered, the lease had never been granted, so the High Commissioner informed the Australian authorities. An Australian parliamentary inquiry in 1921 exposed Caldwell's fraud and the Commission's gullibility. Despite delays in settling the French claim, San Cristoval Estates finally obtained the promised lease in January 1924. 30

Vanikoro covers an area of about seventy-two square miles [18,650 ha]. Reefgirded, it rises rapidly from the mangrove-fringed coast to its highest point (Mt Popokia), 3031 feet [924 m] above sea level. The site selected for the base was at the head of Saboe Bay (Sapolombe Bay). This proved a most insalubrious place

for the first group of loggers, hired in New Zealand. The New Zealanders encountered a trying, humid environment. The daily temperature is about 32 degrees Centigrade, falling to 22 degrees at night. Vanikoro is the wettest place in the Solomons, and the Pacific islands, receiving 250 inches [6350 mm] a year on the coast, and probably far more in the inland ranges, with rainfall daily for two-thirds of the year.<sup>32</sup> Of the fifteen experienced kauri bushmen from New Zealand who arrived in late December 1923 to commence operations, only four remained in June 1924, the rest having been invalided out,<sup>33</sup> even after the settlement was relocated at Paeu, 'a good site with streams of good water'.<sup>34</sup>

The establishment of the Vanikoro operation cost more than £40,000 of capital. The last of several calls on shareholders in 1925 was unsuccessful, so a new company was formed, the Vanikoro Kauri Timber Company. San Cristoval Estates had a half share and the Melbourne-based Kauri Timber Company had the other. The consideration was the transfer by San Cristoval Estates of their Vanikoro assets, including the logging rights, while the Kauri Timber Co. put up £40,000 working capital and paid San Cristoval Estates a further £10,000 for agreeing to the deal. Most of this was used to pay off their Vanikoro debts. 35

As its name implies, the Vanikoro Kauri Timber Company wanted kauri (Agathis macrophylla) for the Australian market. From the 1850s, Melbourne buyers had purchased huge volumes of kauri from New Zealand to build its mansions. A group of Melbourne capitalists invested in the kauri (Agathis australis) logging in New Zealand in 1888.<sup>36</sup> By the 1910s, the New Zealand supply was all but cut out and exports restricted; hence the Melbourne-based Kauri Timber Company's interest in supplies of a related species.<sup>37</sup>

As well as kauri, there were other valuable trees, including the ba'ula (koila). u'ula, and liki (Calophyllum spp., Intsia bijuga, and Pterocarpus indicus respectively). These were in mixed forest as was most of the kauri. Unlike the New Zealand kauri, the Solomons kauri was not in great stands. On Vanikoro, it was scattered on rugged spurs and ridges inland.<sup>38</sup> Of these timbers, the company was mainly interested in the kauri and koila, estimating in 1925 that there were 10.000 acres [4050 ha] of kauri and 40,000 [16,200 ha] of koila which would give 150 million and 60 million super feet [451,500 and 180,600 m<sup>3</sup>] respectively.<sup>39</sup> Most of the koila, a hardwood, was for specific purposes such as ships' keels and timbers, while the kauri, a softwood, was used for flooring and building as well as for boat building and liquid containers.<sup>40</sup> In the late 1920s, the Kauri Timber Company in Melbourne was investigating the economics of plywood, initially as a log supplier but by the late 1930s as manufacturer. Kauri proved excellent for plywood. Trials were also made on the koila. Another timber found on Vanikoro, karamati (or kete kete, Campnosperma brevipetiolata) from 1929 on became part of the log exports from the island to Melbourne as did 'rosewood' (Xylocarpus granatam) for veneers and furniture, and odd lots of 'oak,' 'whitewood' and 'Brian Boru.'41 Kauri made up more than 85 per cent of the exports from Vanikoro with koila at around 5 per cent. Peeling the log for plywood resulted in 'hundreds of thousands' of Victorian butter-boxes in the 1930s made from Vanikoro kauri because it did not taint the butter. 42 The karamati was not

suitable for plywood and ended up being used for general purposes, particularly furniture-making.<sup>43</sup>

Although a market for the timber had been found, the enterprise was not a total success. Given the technology of the time—hand axes, saws, winches and jacks, steel cables attaching logs to one another in rafts at sea and for winching aboard ships—the extraction demanded much of the labour force of about 100 unskilled Solomon Islanders and 15 Australians and New Zealanders. Most expatriate personnel, sick with malaria, served only six to eight months of their two-year contract. Production was also undermined in 1934 and 1936 when indentured local labour went on strike because of deaths which they attributed to sorcery, rather than illness and the company's deficient food rations.<sup>44</sup>

The Melbourne company did not always do its homework and this was costly of time and money. For example, in 1926 it shipped up from Australia two locomotives and 200 tonnes of tram-rails. With no wharf, the rails were punted from the steamer outside the reef and thrown into the shallows. It then took nine Melanesians and two Australians using a steam hauler weeks to drag the rails ashore. The engineer who came to assemble the locomotives considered them 'far too heavy for the soft ground on the flats of Paeu Bay and their coal consumption would make them a failure financially.' He awaited the next steamer to Sydney, the same steamer bringing the man to erect the tramline, which required ballast in its foundations and, as there was no rubble available, a stone crusher, which like the coal, would need to be imported.<sup>45</sup>

Difficulties coalesced in the early 1930s. The Australian market faltered just as the increased tariffs were imposed. The company was in trouble with the Protectorate government in 1930 because for years it had felled trees for construction but had not paid the royalties which the government then claimed. This dispute went as far as the British Colonial Office and its forestry advisers who were shocked to find that the original agreement also contained no reforestation requirement. The dispute was finally resolved in 1937 with a royalty on the volume cut (at 1s 0d per hundred super feet [0.3 m³]) rather than on the number of trees felled, but it had cost the company money. The market had picked up in 1933 just as the tariff fell from 30 per cent to 20 per cent, but the company had to cope with irregular shipping during the Depression.

There was a more systemic problem, however, that bedevilled the operation in the mid-1930s and thereafter. As well as the sheer costliness of extracting scattered, mixed timbers on rough terrain, the pattern of extraction had been haphazard. 49 As the district officer commented that successive managers,

possibly realising that their stay would be a short one, concentrated on getting out the easiest timber to make a good tally, consequently the eyes have been pulled out leaving large quantities of timber behind the old workings which may not now be profitable to obtain.<sup>50</sup>

By 1934, the San Cristoval Estates ran out of funds and the Kauri Timber Company bought out its interests. Losses mounted, and in 1939 the Kauri Timber Company wrote off £43,000 with £50,000 still owed by the Vanikoro Kauri Timber Company to the parent company. Finally, in 1941, the Vanikoro Timber

Company was put into liquidation and wound up. Its plant was taken over as a branch of the Kauri Timber Company, with the money still owing to the Melbourne company being capitalised as establishment expenses. The amount of £76,000 was then put into a 'Forestry Properties' account to be written off over the estimated remaining 100,000,000 super feet [301,000 m³] of log timber (a considerable over-estimate) on Vanikoro. The Pacific war forced the company to cease logging, while rot and borers soon consumed its stockpile at Paeu. 52

#### War and loggers

During World War II an enormous amount of local timber went into construction for the military. Over 10,000,000 superficial feet [30,000 m³] was cut and/or milled between 1943 and 1946 by the Allied forces alone. Many Allied timber men appreciated the potential of the tropical timber and several tried to persuade the Solomons government to allow them to return as commercial loggers, as well as the New Zealand government seeking timber for urgent post-war reconstruction and several Australian and New Zealand companies. A former Kauri Timber Company employee, A. Dethridge, headed a syndicate of ex-servicemen and tried to obtain a logging right for Santa Cruz (Ndeni). All these had to bide their time as the Solomons government preferred to await the outcome of a forest survey by F. S. Walker commissioned in mid-1945. Both Walker and the Colonial Office favoured the establishment of government forests—the forest estate, so that, unlike the Vanikoro concession, reforestation with economic species could be carried out after the first cut of native forest.

This meant the establishment of a Department of Forestry as well as finding 'vacant' land for the forest estate. With post-war manpower shortage, these both took much longer than anticipated. The Department started with a skeleton staff in 1952.56 The quest for forested land awaited a Lands Commission examination to ascertain the nature of native tenure. This was not completed until 1957. No such vacant land had been found by 1961 because the Solomon Islanders did not admit the concept of it existing.<sup>57</sup> Thereafter, increasing suspicion of the government's intentions meant that the department was forced to locate the forest estate on existing alienated land it bought or on land directly purchased by the government from the native landholders. Thus, the potential loggers of the late 1940s had given up long ago and, by 1960, the demand for tropical hardwood in the industrialised countries, especially Japan, was being met mainly by Sarawak, Sabah and the Philippines where the forests carried greater volumes than in the Solomons.<sup>58</sup> Now, getting logging companies interested in the Solomons, rather than fending them off became the challenge for K. W. Trenaman, the chief forestry officer since 1956.

## Rebuilding the Solomons

Although immediately after the war investment in logging for export by foreign companies was put on hold in the Protectorate, rebuilding had commenced, but imported timber was scarce and expensive. The government obtained some local supplies from the mills of the Christian missions, but they were not commercial millers and needed to rebuild their own churches and schools. By 1951, High Commissioner Gregory-Smith, summed up the government's predicament: 'Without timber...we will quite definitely have to considerably curtail our development programme not only in Honiara, but in the Protectorate generally.'60

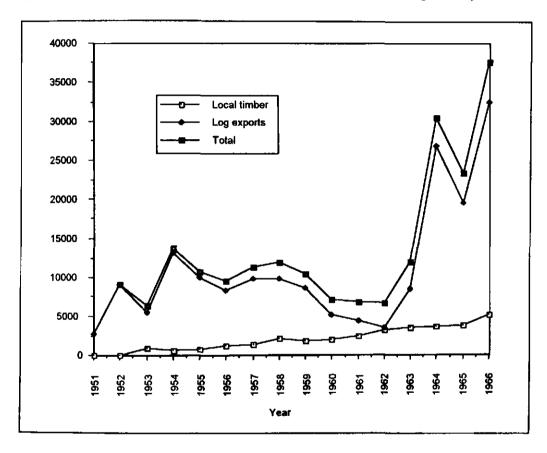


Figure 1: Timber production and log exports, 1951-1966 Source: FDAR, 1953-65

A solution seemed close at hand in Tenaru Timbers. When Dethridge's timber syndicate failed regarding Santa Cruz, he looked elsewhere. He and Australians, Ken Dalrymple-Hay, Norman Wallis, and Harold Davies had formed a new syndicate, Tenaru Timbers Pty Ltd in 1950. They negotiated with Lever's who held the land at Tenaru, north Guadalcanal, east of the new capital, Honiara for a lease for five years and an option for another five years at £3000 annual rent. The government was in a quandary. It wanted timber and the syndicate was willing to sell milled timber locally, as well as exporting logs to Australia. Yet, as the Secretary of State of Colonies reminded the Protectorate, the principles of

sustainable logging were to be the foundation of the industry, with replanting essential. 62 However, under the existing legislation, the government had no power to demand reforestation on privately-owned land and neither Lever's nor Tenaru Timbers was willing to undertake it. 63 Besides an outright refusal to approve the transfer of the timber rights which might prove impossible under the law, the government could do little but accept the company's assurances regarding extraction of mature trees to encourage natural regeneration. 64 Its only bargaining chip was the probability that the company would want concessions elsewhere and a good record at Tenaru could induce future government support. 65 Tenaru Timbers had sent a trial shipment of 50,000 super feet [150 m³] of Mangifera salomonensis and Pometia pinnata logs to Australia. The success of this shipment meant the company signed the agreement with Lever's in August 1951 to lease 11,000 acres [4450 ha] between the Tenaru and Naliumbiu rivers. 66

The Protectorate sought to impose some tax on the operation and Tenaru Timbers tried to avoid it. The company proposed that it would sell locally at between 105s and 110s per hundred super feet [0.24 m³] of milled timber, providing the government imposed no levy or tax on their output for five years. Though the High Commissioner in Fiji was willing to consider this, the Secretary of State in London insisted on some immediate tax on exports because the company could log rapidly, 'creaming' the forest, before the tax moratorium was over, thus destroying any chance of successful natural regeneration.<sup>67</sup>

The Protectorate's financial secretary faced a dilemma. The only payment in respect of timber extraction was the royalty of the KTC at 1s per hundred super feet [0.3 m³]. Placing a royalty on Lever's sub-lease was of dubious legality, so the only solution was an export duty to which the Kauri Timber Company objected. Tenaru Timbers maintained it was paying the equivalent of royalties in rent to Lever's, so the government postponed the duty until 1953. Both the Kauri Timber Company and Tenaru Timbers continued to plead for further postponement. They had a good case. Their export market, Australia, in early 1953 had introduced a quota system on imported timber and re-imposed import duties of 7.5 to 17 per cent on logs and sawn timber, except for its territory, New Guinea. Exempt from Australian income tax, New Guinea-based timber exporters thus had a further advantage in selling timbers similar to Solomons' species on the Australian market. The Protectorate also faced competition from Fijian timber which buyers considered superior. Consequently, in August 1954, the government decided to shelve the proposal because,

the imposition...might now lead to withdrawal by both Companies from their present operation...it would certainly remove all hope of getting anyone else interested in timber exploitation in the Protectorate. As we do get a certain amount of indirect revenue from the two existing Companies I should prefer to make certain that we retain all the revenue...<sup>70</sup>

#### Tenaru Timbers Pty Ltd

As Tenaru Timbers began production, demand was so great that the sawmill at Tenavatu, owned by Davies, ran short. He tried to persuade the government to allow him to log the *Terminalia Brassii* on a 400 acre [160 ha] section near Dodo, in the Ilu area of north Guadalcanal. Davies proposed to sell to the government at a lower price than the timber milled for Tenaru Timbers and was willing to pay rental or royalties to the landholders. Although the government was disappointed at Tenaru Timbers' preference for exporting to the neglect of the local timber market, Davies' scheme failed to get its support. Davies was in contention with the local Tasimboko people regarding lands held by Lever's and Burns Philp and the Government was unwilling to inflame the situation by allowing logging negotiations there. This new awareness exemplified the increasing 'land consciousness' of Solomon Islanders, creating fears, well-founded in the light of acquisitions under the so-called Wasteland regulations of the early 1900s, that the government still wanted their land. Had they read Walker's report, their worst suspicions would have been confirmed.

Throughout the 1950s, Tenaru Timbers continued to experience log shortages, mainly because of poor extraction patterns. Initial prospects had been good as the company achieved a level of mechanisation unheard of in the pre-war Solomons. The local workers felled the trees with axes, then cut them into 15 to 25 feet [4.5-7.6 m] lengths with Danarm petrol-powered chain saws. From the felling site, the logs were loaded by crane onto trailers (ex-wartime torpedo carriers, caterpillar tracked) and hauled along rough tracks by trucks. In time, tractors replaced some of the trucks, although the trailers often got bogged during the wet season. In 1954, at a cost of £10,000, the company introduced a railway system with two petrol-driven locomotives to bring the *Mangifera salomonesis* logs to the beach and thence by truck to Tenavatu where they were floated out to ships. Though the company had to contend with losses in rough seas because there was no natural harbour on north Guadalcanal, log exports increased over previous years. 73

Although the milled timber was unseasoned and some of it badly cut, careless extraction by unskilled employees did not improve log quality. By 1956, Tenaru Timbers had abandoned the rail system and was hauling logs by tractor for up to three miles, taking a toll of time, plant, labour and log. Most of the company's machinery was secondhand and servicing costs increased. The company went into voluntary liquidation in late 1957 when most of the *Mangifera salomonesis* had been felled. A subsidiary run by Davies kept the milling going, but the proposed export duty finally came in 1961. The company exported no logs in 1961 and 1962 when the British Solomons Timber Company purchased the interest. By then, local sawmills were producing almost three-quarters of the Protectorate's consumption. Despite its limitations, Tenaru Timbers had supplied over a half of this contributing significantly to the Protectorate with its post-war reconstruction. It had been partially successful in its export of logs, though the chief forestry officer suspected that, as in the 1920s, Australian timber combines opposed

imports from the Solomons, particularly of hardwoods.<sup>74</sup> Lack of reforestation, however, saw the virtual extirpation of the *Mangifera salomonesis*.

## Kauri Timber Company

By far the greater volume of timber exported was in log for the period 1951-1963 and the bulk of this was from Vanikoro. From 1949, Queensland contractors, Haling Brothers, took over logging for the Kauri Timber Company. The Melbourne company estimated that an annual output of 4,000,000 super feet [9,400 m³] was needed to meet Australian demand and to return a profit. Volume was value. After six years, the contractors had failed to achieve this. Their maximum never went beyond 2,600,000 super feet, [6100 m³] although they claimed they could produce 3,600,000, [8500 m³] under ideal conditions. The company was unimpressed, so did not renew Halings' contract in December 1956

Halings attributed their lack of success to labour problems. There was a chronic shortage of local labour in the Santa Cruz district and more attractive alternatives elsewhere. As the indenture system gave way to civil contracts in 1947, the labour force was in an ideal bargaining position which they exploited, driving up real wages and obtaining a 40-hour working week. No longer was the district officer based at Vanikoro so he was far less able to act as a mediator in disputes. Halings provided no amenities for the 15-20 European bush-workers, several of whom were 'New Australians,' living mostly in caravans at the timber head. This small fractious community chaffed under poor management. Good workers became frustrated. One 'New Australian' engineer,

...went because he could not stand the...method of working. He was expected to keep trucks running continuously, by patching them up from day to day, until it (sic) fell to bits. This was anathema to him. To his way of thinking each truck should come right off the road and be serviced properly at regular intervals, instead of going on until it was nothing but a battered chassis six months after delivery.<sup>80</sup>

Though illness became less a problem with modern drugs, from 1949 and to early 1953, 54 employees from Australia cancelled their contacts before having worked the agreed two years, which did not help continuity and supervision.<sup>81</sup>

Sloppy supervision meant that basic servicing was left to Solomon Islanders who had little understanding of the nature of wear on mechanical parts which then seized up, causing in lost production. The labourers lacked expertise and, without consistent supervision, produced logs that were sometimes defective. Poor spraying and delayed shipping reduced the quality of logs by enabling borers and toredo worms to attack them. As a result, the plywood cut from this kauri was full of holes and thus either rejected or sold as low-grade ply, as 'backs and centres...much in excess of face veneers'. As well, though post-war mechanisation had the potential to make logging less labour-intensive, the company often purchased secondhand or unsuitable equipment.

Halings logged kauri (Agathis macrophylla), karamati or ketekete (Campnosperma brevipetiolata) and koila (Calophyllum spp.). The koila was a hard, tough wood, but was used for much the same purposes as Australian hardwood. Even when jarrah (Eucalyptus marginata), the hardest Australian wood, was brought to Melbourne from Western Australia, it was still 25 per cent cheaper to produce than Vanikoro koila, so the demand for the latter remained confined to ships' timbers and lifting sticks. Improved technology, involving the steaming of the wood, enabled it to be peeled for plywood, but during the 1950s, its colour lacked market appeal. Karamati was particularly susceptible to toredo worm and in 1954 the Melbourne firm was getting only 40 per cent recovery from the Vanikoro logs.<sup>87</sup>

After Halings left, the Kauri Timber Company had to write off £150,000. Reaping the rewards of the post-war Australian building boom and the increasing scarcity of indigenous pine species, the parent company in Melbourne had made profits, from 1949 to the end of 1955, at the expense of the branch company from plywood and sawn timber cut from the Vanikoro logs. Both the chief forestry officer, Trenaman and the British forestry adviser recognised a form of transfer pricing whereby the Melbourne company purchased logs from the Vanikoro branch at a rate which suited its purposes for Australian taxation and sold the sawn timber at a healthy profit in Australia.

After the KTC had resumed control of logging there was little improvement. Labour conflicts persisted. 90 Because it held the Australian import licence quota for Vanikoro and feared heavy capital loss if it abandoned the branch, the company continued operations, encouraged by early production figures of over 2,000,000 super feet [4700 m<sup>3</sup>]. However, the company's agreement was due for renegotiation in 1957. The Protectorate government was willing to extend it for a further ten years, but planned to increase the royalty from 1s to 6s 6d per hundred super feet [0.24 m<sup>3</sup>]. The company thought this rate excessive and managed to get a continuance of the old royalty to late 1957 when an interim rate of 5s for kauri came in. An independent assessor was consulted to recommend royalty based on the financial analysis of the company. To the company's shock, the assessor's analysis fully supported a government royalty of 9s per hundred super feet. This was phased in by 1961.92 Along with Tenaru Timbers, the company had escaped the proposed export duty on its logs in 1953. Expecting a predicted expansion of exports, Trenaman had supported a duty which came into operation in late 1961. However, so the company would not be taxed twice for the same log, the export duty, though levied, was subtracted from the royalty. This gave the company parity with others then working government-owned land. Thus the royalty rate, 9s, so long as the duty was not greater, remained the ceiling of 'taxation' to government.93

Meanwhile, the Kauri Timber Company had allowed its plant to deteriorate, thus by 1959 it faced costly replacements or declining production. Most costs were fixed so it had to produce 2,750,000 super feet [6500 m³] yearly to get the unit-volume cost to 'break even point'. There was still kauri on Vanikoro; the only trouble was that decades of lack of working plans had left the bulk of this

inland or in isolated pockets, so increasing extraction costs.<sup>94</sup> Methods of extraction were still inefficient—roading did not keep up with logging, so logs were often hauled long distances. Embedded rock in these logs frayed both saws and patience of the Australian plywood millers. Although about 60 per cent of the kauri ended as sawn timber, its value too was considerably reduced if the logs were faulty.<sup>95</sup>

As well as the new royalty scale the company faced increased Australian duty in 1961 on 'saw' logs, but not on 'peeler' logs. The company could only shelter for a short time under Customs' misapprehension that their logs imported were peelers. Quarantine was another issue. When any sign of insect infestation was found in Australia the company had to pay for fumigation, adding 2s per one hundred super feet to the costs. <sup>96</sup>

The managers at Paeu blamed local conditions, but the mother company was running into trouble. The Kauri Timber Company in Australia from about 1944 had bought out many milling and plywood companies and diversified into other enterprises. Over-extended, it was caught when the economic recession of 1961 resulted in a downturn in the building industry, forcing it to sell many of its interests. In the process of reconstruction, it wrote down its capital by 62 per cent in 1963. 1s plywood sales had already received a blow when in 1960, the Australian government granted Japan and other foreign countries export licences allowing cheap plywood into Australia. 98 The company no longer depended on Vanikoro for its pine supplies. In 1954, the Vanikoro kauri logs landed 'in the yard' at the subsidiary, Brisbane Newmarket Ply Company, cost 116s per one hundred super feet, while imports from South-east Asia, were 99s and hoop pine (Araucaria cunninghamii) from local sources was about 76s.99 This pattern persisted for the next ten years with not only red cedar (Shorea macroptera and other spp.) and white cedar (Parashorea malaanonan) from Borneo, but also ramin (Gonystylus macrophyllum) and bindang (Agathis alba), all of which remained cheaper than the Vanikoro kauri and were in regular supply. By 1960 cheap klinki pine (Araucaria hunsteinii) from New Guinea was available. Plywood from Vanikoro was meeting buyer resistance. It was no wonder that by 1963, the Melbourne company officials could say of the kauri on Vanikoro 'we do not now necessarily want the timber.' A cost-benefit analysis in late 1963, revealed production on Vanikoro had not achieved even the allowable cut of 3.000,000 super feet [9000 m<sup>3</sup>] a year and continuance at the current rates would mean an annual loss of £25,000. 101 The company decided to withdraw in early 1964. It had never been a great success, but had survived mainly because it subsidised the sawmill business in Melbourne.

The closing of the Kauri Timber Company was a concern to the British administration because a sustainable logging industry was to be a cornerstone of the country's future economic viability. The other major logging enterprise, Lever's Pacific Timbers, a Lever's subsidiary, was logging hundreds of acres of its unplanted lands in the western Solomons. Lever's invested heavily, opened the Japanese market to Solomons' species, imported an international force of skilled operators, trained local timber workers and built a network of logging roads for

systematic mechanised extraction. 102 By 1963, Trenaman had secured part of the forest estate and invited four companies to join Lever's in logging. Forest estate lands were to be leased under specified controls on logging in return for the security of logging government land. Initial outlay on a logging venture, as Vanikoro had shown, was high. Most companies wanted twenty years' guaranteed production to recoup and make a profit. Along with possible access to contiguous areas, reforestation and regrowth, in theory, could make a commercially sustainable cycle. 103 Four areas were offered: parts of the Shortland Islands, the Allardyce Harbour area of Santa Isabel, Baga Island (Mbava), and Viru on south New Georgia. There were several companies interested including a Japanese consortium, the Shortland Development Company, Another was Nanpo Ringo Kaisha Ltd (who had become principal shareholders in the British Solomons Forestry Company) which had started on Baga in 1963 and had an option on Vangunu. However, establishment problems, falling demand in 1965 and market resistance to the unfamiliar Dillenia saw it withdraw from the western Solomons in 1966. The third company interested in Viru was the Kalena Timber Company which was involved in logging in South-east Asia and whose directors were G. E. C. Mears and D. A. Ireton. 104 The fourth company, Allardyce Lumber Company, was the only one with any Australian interests. Its parent company was Cullity Timbers of Western Australia which was associated with another company whose principals included Lester and Devon Minchin. Lester was a former major in the Allied forces and had seen the potential of the ramin (Gonystylus spp.) on the floating islands in the Rejang delta, Sarawak. By 1963, the Minchins had the largest timber concession in Sarawak, but Britain's departure saw the company planning to pull out and diversify its sources of supply. 105

## Allardyce Lumber Company

Allardyce shipped men and materials from Sarawak, commenced operations on government land on Santa Isabel in 1964 and soon struck problems. The coast was lined with mangrove swamp, no gravel for roads could be located, and the tree counts from coast to ridge indicated only about 25 cubic metres per hectare, at least 70 per cent stocked with *Campnosperma brevipetiolata*. <sup>106</sup> The logs floated which made it much easier to load them onto the ships. It was soft, pale-coloured and peeled well.

For five years the company exported *Campnosperma* and the tall swamp species, *Terminalia brassii* to Australia and Japan at a loss. Roading and transport costs per cubic metre alone were \$8-\$9.<sup>107</sup> The clay-like soil was unable to cope with the rain or the traffic, until intensive research in Sydney was done on surface compaction in 1969. The business recovered and by 31 May 1972, had made more than a million US dollars. That night, cyclone struck Isabel, destroying virtually the whole resource. <sup>108</sup>

The forestry department found the company responsible and efficient. Anxious to keep Allardyce in the Protectorate, once the salvage logging was completed, it offered government land of 30,000 acres [12,000 ha] at Santa Cruz (Nende) and

at Alu, as a consequence of the Shortland Development Ltd's withdrawal. 109 Allardyce started logging kauri on Santa Cruz in 1973, destined for Japan, France, and New Zealand. But like Vanikoro, stocks were sparse and scattered so by 1980, roading costs and aging equipment forced the company to pull out, leaving a mixed reputation. The Eastern Islands Council had been promised infrastructure that had not eventuated. There were also allegations of unauthorised logging on customary land. 110

The Shortland Development Company had withdrawn from Alu in May 1972 because of difficulties with marketing and handling the sinker logs among the *Pometia pinnata*, a species which produces look-alike floaters. Allardyce solved this problem and began logging on government land in 1977. The business methods of most of the other companies are questionable, but Allardyce has achieved more respect. Like other companies, most of the logs cut by Allardyce went to Asia. Devon Minchin remained a director in 1983, but new and dominant interests were represented, including Hong Kong and Malaysian nationals, so the Australian connection became negligible.

#### Conclusion

During the colonial period to 1978, the Australian companies laboured under considerable difficulty. Beyond their control were tariff barriers set up by their nearest market, Australia. In 1930, 1953 and 1961 various Australian import duties and quotas pushed down the level of profitability of operators in the Protectorate. Both in the late 1920s and 1950s, Solomons officials complained of the Australian timber combines excluding Solomons timber, but had not the commercial or political means to circumvent them. The opening of the Australian market to cheap ply from Japan and logs from South-east Asia in the 1960s proved the end of the KTC and the weakening of Australian interest in Solomons timber. Some would argue that the Protectorate's caution immediately following the war precluded its early entry into new markets within and beyond Australia, but Australia's traditional supplies soon recovered and it seems likely that the South-east Asian producers of the 1950s and early 1960s would have also provided overwhelming competition. The two post-war operators, Tenaru Timbers and KTC found it difficult to cope with the moderate duties and/or royalties imposed by a patient adminstration. Their downfall lay more with their unwise choice of war-surplus and other secondhand equipment while plant maintenance was often skimpy and reactive. Coupled with the almost total lack of skilled local personnel and often poor management, these companies were on a cliff edge that an additional Australian or Solomons duty levy could topple. Even logging companies with financial resources for research and skilled personnel, could falter—Allardyce almost did so by a chance cyclone, while the powerful Lever's was defeated in 1986 by land disputes, local resistance and the promises of Asian competitors on New Georgia. 112

#### **Afterword**

After independence in 1978, the Solomons government permitted logging on customary land and by the early 1990s, desperate for finance, it had abandoned the forest estate concept and, with it, sustainable logging. There were a couple of companies with some Australian principals investing in logging. By and large these were undercapitalised and soon faltered or, like Allardyce, were absorbed by Asian interests during the 1980s. The Asian loggers who had been so successful and so ecologically devastating in South-east Asia were on the march, seeking new forests. They are backed by sophisticated networks of affiliated firms linked into the great companies of Japan, the main buyer of tropical logs; networks so powerful that they push up production by various and often illegal means and keep prices to growers down. The Solomons is the last major Pacific outpost of the forest of Malesia and its fate will be no different to that of much of South-east Asia. The current reduction of the excessively unsustainable cut is but a hiatus, not a reprieve, induced by the present economic downturn in Asia.

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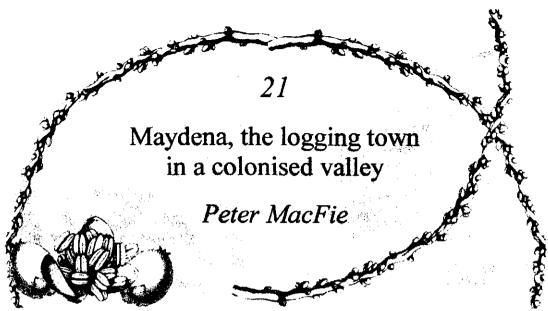
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#### Introduction

This paper investigates the formative years of Australian Newsprint Mills' logging operation in southern Tasmania, the establishment of the logging town of Maydena, and the impact of the industry on the sociology of the Tyenna Valley. The impact of the new culture on the old was effectively the colonising of a valley.

In 1996, I undertook the Maydena Project for Forest Management, a Division of Australian Newsprint Mills which is now part of the Fibre Division of Fletcher Challenge. The oral history-based study aimed at recording the social and industrial history of a purpose-built logging town, centred around the extraction of old-growth forest from the company's large concession centred on the Florentine Valley. Over a two-year period, over eighty former employees and their spouses were interviewed. They included fallers, machine operators, high-lead riggers, mechanics, drivers, managers, clerks and foresters. During the course of the project it became apparent that I was examining a human as well as a physical landscape, with the one interacting and shaping the other in a mutual—but not always compatible—way. This paper is drawn from the research for a forthcoming book on the project.

In the Australian 1950s children's book by Leslie Rees, Digit Dick visits Tasmania, among many adventures Digit and his friend Boska the budgerigar witness the end of a swamp gum. The tree is cut down by 'two men in shirts and rough hats carrying axes...who make a platform and cut down the great swamp gum.' The tree complains:

That's what's going to happen to me I shan't much longer be a tree.
Two timbermen with axe and all Will sever my trunk and down I'll fall.

'I do feel sorry for the poor tree,' said Dick, 'but I suppose it can't be helped. Daddies must have their newspapers in the morning.' The dilemma in the Digit Dick fable is felt by many, then and now. The fable also illustrates the male-ness of the industry and the consumer of the paper. Most significantly, the bush-worker is illustrated providing for the needs of the urban dweller; as producer and consumer, they needed each other.

My interest in the dilemma over land-use and choices, (the sort historians love to explore), grew from a study of Mt Field National Park, the island's first such reserve, established in 1917 in central Tasmania. Contrasts in the social setting and conflicts over land-use between settlers, sawmillers and early conservationists who established the Park were part of on-going tensions. The debate also involved Australian Newsprint Mills who were allocated a section of the Park in 1948 in controversial circumstances.<sup>5</sup>

Apart from Watson's book on the forests of northern New South Wales, and Borschmann's recent (1999) *The People's Forest*, no comparable approach in Australia that I am aware of seems to see the conflict over forestry in human and social terms. Most authors prefer to concentrate on environmental impact of logging in forests. An understanding of the era must be set against the markedly different concepts of national identity then and now. Until the 1980s, Australian nationalism was symbolised in locally-owned industries that served as icons for national pride, these were not only the mundane items epitomised by brands like Amotts biscuits, Vegemite and IXL Jams, but attempts to develop national motor, aircraft, airline, and ship-building industries.

While John Dargavel and others see the development of the Australian paper industry centred around the movement of international capital, the general aim of all Australians of all classes born before 1960 was to see an image of national self-sufficiency. This image extended to an independent newspaper and media industry, and included an Australian supply of newsprint—all outside foreign control—and made from native timbers. But until the Boyer mill opened in 1941, Australia was totally reliant on imported newsprint.

## The colonised valley

The Tyenna Valley from where Australian Newsprint Mills drew its work-force was 'settled' or colonised twice, first by the settlers (1880-1930) and then by the Company (1930-1991). From self interest, the two cultures that were present in the Tyenna Valley had a symbiotic relationship, but not without problems and pitfalls. The stories, the characters, and bush skills came from the old culture, while management issues and decisions on new technology or promotion came from the new culture. The former was strongly egalitarian (and often Catholic), the latter, paternalistic and hierarchical, (and predominantly Anglican).

Whatever the source of finance and the motives, decisions effecting the lives of a local community were made by Melbourne based investors, a familiar story even in a post economic rationalist era. A small inland district of Tasmania was to become the place where national identity was epitomised, based on the

newsprint logging industry and two purpose-built townships at New Norfolk and Maydena. Rapid post-war expansion was followed by the end of old-growth logging and subsequent closure of the logging town of Maydena. From the 1980s the Derwent and Tyenna Valleys became a testing ground for the impact of new post-national and internationalised forms of ownership.

#### Historical background, the Tyenna Valley

The Tyenna and Florentine Valleys spread around the Mt Field Plateau like a giant 'question-mark'. The Tyenna River runs south into the Derwent River, and the Florentine River runs north also to the Derwent. In 1917 Tasmania's first National Park was opened, centred around the unique alpine vegetation of the Mt Field Plateau. The dilemma over land-use was apparent at the Park's opening ceremony where a feature of the afternoon's entertainment was a chopping match.

The first Europeans to explore the area were in a party led by Surveyor James Calder assisted by the former convict and expert bushman, Alexander McKay in 1837:

After climbing onto the Mt Field plateau, Calder's party descended down the steep, rocky slopes of Mt Field West to the Gordon River. Recovering at the camp, Calder commented on the exhausting trip where '...the greatest exertions have been made and the most laborious and harassing journeys undertaken... Every man in the camp is suffering...and not a nerve or muscle has been left unpunished.'10

From the 1880s, settlers took up land in the Tyenna Valley, based on trapping and small farming. <sup>11</sup> The village of Tyenna was established as a remote out-post. Exploration of south-west and central Tasmania continued throughout the last quarter of the century for minerals. Bushmen like Robert Marriott guided parties from Tyenna into the wet forests. A railway to Tasmania's West Coast was surveyed but the idea abandoned in 1898.

The Tyenna Valley was also the home of the Thylacine or Tasmanian Tiger, now thought to be extinct. The last known specimen, a male, was brought from the Florentine Valley to the Beaumaris Zoo, Hobart in 1930, probably by Elias Churchill. He snared eight 'tigers', including four in the Florentine and around the Needles; areas where Australian Newsprint Mills was to be granted a logging concession seven years later.<sup>12</sup>

The movement of settlers and sawmillers into the Tyenna Valley was hastened by the gradual spread of the Derwent Valley Railway, which curled its way up the valley, reaching Fitzgerald in 1917.<sup>13</sup> New bush workers arrived from sawmills in the southern forests, Bruni Island and the east coast. Many small and several large sawmills were built along the line using sidings and small spur-lines to load their timber. The largest were the Huon Timber Company's Mill at Tyenna, Gourlay's at Fitzgerald and Risby's past Junee, where timber tramways extended on into the bush. However, the railway served two potentially conflicting purposes, the extraction of sawn timber and visits by excursionists and anglers to Mt Field National Park and adjacent streams.<sup>14</sup>

#### Historical background, newsprint from eucalypts

In the board rooms of Melbourne and the laboratories of scientific bodies, decisions were being made which would alter the character and employment patterns of the remote Tasmanian valley. World War I had left Australia destitute of newsprint. Among the many who felt the isolation was a young Australian journalist, Keith Murdoch, who broke military censorship to expose the news of the debacle at Gallipoli. He was steered through the ranks of Melbourne's Herald and Weekly Times by Theodore Fink, becoming managing director in 1928, before falling out with his mentor. Today the Fink and Murdoch 'camps' are divided over the claim to have started the newsprint industry. Both men had witnessed Australia's vulnerability to shortages during war and were determined to not let it happen again.

The idea of a newsprint industry from Australian timbers was not new, but preliminary tests and European attitudes were disappointing. In 1923 L.R. Benjamin, a young chemist who had trained in Western Australia under I.H. Boas, arrived in Tasmania to discuss a survey of the island's timber resources. They had both worked for the forerunner of the CSIRO. The Tasmanian Forestry Department conducted a survey of the Florentine Valley in 1922, while the Commonwealth provided sea-planes for aerial surveying, all with the intention of assessing timber resources for the manufacture of paper from native species.

#### Tyenna's first value-added industry

Another smaller player had already seen the possibilities of the Tyenna Valley. After a failed attempt in Victoria's Yarra Valley, Hans Hecht, a German, established a large peg factory at New Norfolk 22 miles [50 km] north of Hobart in 1926. Using the white and stainless sassafras for its famous dolly pegs, the Pioneer Woodware Co. was given forest permit blocks in the Tyenna Valley from where logs were extracted by men and horses, then railed to New Norfolk. Compared to the sawmills which produced only sawn timber, in its small way the peg factory became the first sustainable and value-added industry based on timber in the Derwent Valley. In extracting under-storey species, Pioneer Woodware complemented Australian Newsprint Mill's interest in falling the dominant eucallyptus species, so that the two companies shared a converging history.

# Australian Newsprint Mills, the other culture

Two paper giants battled for access to Tasmanian timber; the Collins House group with Gerald Mussen—which eventually set up the Burnie paper Mill in 1936—and a newspaper syndicate of Fairfax and the Herald and Weekly Times. The syndicate, led by Keith Murdoch and Theodore Fink, was attracted by large tracts of virgin bush and cheap hydro-electricity. They lobbied the Tasmanian Labor Government, then embroiled in the severe Depression. Theodore's son, Thorold, was given responsibility for establishing the first phase of the industry. The initial company was known as the Derwent Valley Paper Co., whose nomi-

Government under the terms of *The Florentine Valley Wood-Pulp and Paper Industry Act* of 1932.<sup>21</sup>

The reformed company began serious research into newsprint produced from eucalypt. It poached L. R. Benjamin from the Mussen group. In 1934 it sent a trial shipment of eucalypt logs to be tested in Crown Zellerbach's pulp and paper mill at Ocean Falls in British Colombia. Australian Newsprint Mills had an industrial and financial relationship with this Canadian multi-national.<sup>22</sup> Tyenna bushman, Rex Salter, recalled cutting the logs with his brother-in-law near Fitzgerald, the head village on the Derwent Valley Line in the Tyenna Valley.<sup>23</sup> In Canada, long-shoremen rolled the eucalypt logs from the ship's deck into the sea, as was traditional with the conifers of North America, only to see the logs from 'Down Under' sink like rocks.

By 1934 the Finks had been marginalised within the Herald and Weekly Times and while they and Benjamin were in Canada investigating the processing possibilities of eucalypts, Murdoch and John Fairfax formed Australian Newsprint Mills to see the project through.<sup>24</sup> In an Australian first, paper from Tasmanian eucalypts processed in British Columbia was used in the 26 July 1935 edition of the Hobart *Mercury* and then in the 22 August edition of Adelaide's *News*. (An archive copy of the *Mercury* is distinctly yellow, as the process was far from perfect.) Benjamin and his staff returned to Tasmania and established a laboratory for the new company at Sandy Bay, a Hobart suburb.

## Establishing the industry

The tests in Canada were promising, but just when the new industry seemed viable, severe bushfires in 1934 appeared to threaten it. Apparently started by trappers to the north of the Florentine Valley, the fires swept down into the Tyenna Valley. Several sawmills, miles of tramways and stands of timber were destroyed. Although several homes and a church were burnt, no lives were lost. From the company's view, the fires were a salutary lesson. The cavalier attitude of settlers threatened the future industry, as did the sparks from the steam engines bringing relief fire-fighters and assistance to the threatened villages. Benjamin saw both at first hand and convened a meeting at the village of Tyenna with concerned locals who also feared the loss of the future industry and employment opportunities.

Bushmen skilled in the ways of the bush included families like the Marriotts who were the descendants of convicts. These bushmen led the survey expeditions into the Florentine and Styx Valleys. One of these was led by famous bushman, John McCallum (born 1880), whose house still stands by the Tyenna River. John knew the bush intimately, having worked on the survey of the Great Western Railway to Queesntown in 1898 and having taken Twelvetrees and other geologists into the south-west around 1908.<sup>25</sup> Two of the company's survey teams, including McCallum, were caught in the 1934 fires and escaped by sheltering in a creek bed of the Styx Valley.

Despite the severity of the fires, large sections of the concession remained untouched. From 1937 onward, the company went ahead with its plans. In 1935 and 1937 (now Sir) Keith Murdoch and his new wife Elisabeth, accompanied by a party representing the Australian Newsprint Mills newspaper shareholders, explored the concession on horseback. They were led by experienced bushmen including Allan Rainbird who, when interviewed at 84, recalled Mrs Murdoch (now Dame Elisabeth Murdoch) with affection. He hired a saddle horse for her and remembered her insistence on 'getting on the tea-towel' at the camp site. Her husband was a sterner figure. Referring to Keith Murdoch's visit to assess the forest of the Florentine Valley, Allan commented wryly, 'You wouldn't buy a pig in a bag, would you?' 29

The 1937 Florentine Valley Act formalised the reformed company's rights over the forest under a Concession system. Australain Newsprint Mills had powers usually only invested in the Crown, including access and entry controls, ostensibly to protect the forests from fires. The main attraction in the Florentine Valley concession was a huge stand of Eucalyptus regnans, swamp gums, standing in a one-generation forest of 200-year-old mature trees underneath the steep wall of Mt Field West. Meanwhile, as work began on the Boyer Mill near New Norfolk, Benjamin ordered rolling stock based on North American industry's experience.

#### New alliances

The industry's early integration with North America's logging practices and its paper industry was to have a profound impact on the newsprint and timber industry in Australia. Paul Freydig, an American, became the company's first Logging Manager from 1935, returning to the USA in 1941 to join up as fighter pilot. The trans-Pacific cooperation was fostered at several levels. While Benjamin studied the operation of mills and new technology, Keith Murdoch was forging strong links with the American interests, especially at a political level. He met with Roosevelt in Washington and later instigated the Australian-American Association, which formalised mutual business interests. Politically and militarily Australia's loyalties were to Britain, but the pre-war links of the company's directors with the USA anticipated post-war realignments.

With Australia's newsprint supplies cut off from Europe by Axis submarines, the Boyer Mill came into production. At the opening ceremony in May 1941 co-director Warwick Fairfax gave Keith Murdoch (a rare) compliment on his foresight and drive. The Boyer Mill was strategically placed on the Derwent River near the old town of New Norfolk, half way between the forests and the port of Hobart, and beside the existing Derwent Valley Railway. The finished rolls of paper were loaded on barges and hauled by tugs to Hobart where they were transferred to ships for mainland ports and newspapers.

## **Bush operations**

Australian Newsprint Mill's bush operations were poorly documented, due to war-time restrictions on newsprint and on publicity about an industry declared

mandatory, whose workers operated under the Manpower Act. Oral history proved a last opportunity to document this period.

The company took advantage of the existing infrastructure both industrial and social to establish the industry. The railhead village of Fitzgerald acted as the base in the Tyenna Valley. From there the company constructed spur lines off the existing Derwent Valley Railway to reach the *E. regnans* stands at Junee, Nicholson's Spur and Risby's Basin. Bush workers from the sawmills became the company's new employees, and their bushcraft allowed the logs to be hauled from the forests. A new logging camp was established in the bush at Junee. Men were housed in relative comfort, with a camp kitchen, hot water at communal facilities and heated huts. The huts were laid out in a military style quadrangle.

Many of the older generation of bushmen were returned World War I veterans, including Percy Statton VC. He acted as camp cook at both the Junee Camp and on the next line constructed into the Styx Valley in 1941.<sup>32</sup> He was remembered by many interviewees, who, as young lads, teased him with outlandish practical jokes which he never left unanswered.<sup>33</sup>

While using traditional loading methods, the company also had priority access to newly arrived American Caterpillar crawler tractors equipped with power take-off winches. Gus Cashman was one of the first to drive the new machines. Apart from Caterpillars, another aspect of the Americanisation of the industry was the use of high lead riggers who climbed the tree using harness and foot spurs, rather than a set of spiralling 'shoes' or boards. Tree tops were lopped by the rigger, who then set up the pole as a living 'mast' with giant pulleys and rigging cables. The most famous of the high lead workers was 'Sam the Rigger' Donaldson whose dare-devil feats became legendary. These included dancing on the severed butt of a cable tree, often 45 metres above the ground.

During the war years logs were loaded onto rail wagons with crotch rigs using the steam-driven winches from the sawmilling industry or later the Caterpillar's power winches. Huge swamp gums were logged, including the 'Big Tree' at Nicholson's Spur, recalled with regret.<sup>35</sup> All were railed to the Boyer Mill over 40 kilometres away from the winding, narrow valley.

While Junee was being logged a new rail spur line was constructed into the nearby Styx Valley. At its junction with the Derwent Valley Railway, Australian Newsprint Mills erected Karanja, the Company's first small village which acted as a service centre with a few homes and a workshop. Many legends arose about the Styx line and Cataract Camp. A long, graceful, trestle railway bridge was constructed over Cataract Creek, and a camp of tents and huts built nearby. At Diogenes Creek, near the head of the Styx spur line, a skyline system was erected over a deep gully to winch logs back, the only time this variation on cable logging was used. At war's end, another camp was established for Risby's Basin off the Tyenna Valley, where a small Climax loco hauled trucks from the forest to the main line.

## Post-war expansion

Post-war, the directors wanted to double newsprint production, and began looking for new staff at all levels. A key appointment was that of the Western Australian forester, S. L. Kessell. He was a major figure in the profession of forestry, having advocated the establishment of both the Australian School of Forestry in Canberra and the Institute of Foresters of Australia, of which he was founding president.<sup>36</sup> In planning for post-war reconstruction in a study for the Federal Government in 1943, Kessell reported that the war-time shortage of Australian timber was due to short-sighted historical and cultural attitudes:

The Anglo Saxon settlers who populated Australia brought with them no tradition of forestry...and for a hundred years or more, the forests were looked upon as the enemy of progress to be slaughtered...Even the forests which have been retained have been operated as mines to be worked out and largely discarded or...left in a semi-neglected condition.<sup>37</sup>

In 1944 Tasmania's Forestry Department asked Kessell to report on the State's timber industry. He was then Controller of Timber, head of the war-time Federal department. In his report for the Tasmanian Government, Kessell commented on Tasmania's forest policy and management practices. He wrote a wide-ranging and pungent report, including unflattering comments on Australian Newsprint Mills' forestry operations.<sup>38</sup> In his introductory comment he was emphatic that:

The remaining forests of Tasmania are only poor remnants of the magnificent stands of timber which occupied much of the present developed parts of the island...[I recommend] that no further commitments be entered into by the Government involving the supply of mature timber...to any new pulping or other similar wood-using industry.<sup>39</sup>

Kessell was critical of the lack of planning in Tasmania and the failure of the sawmillers and politicians alike to see the finite nature of the timber which he described as 'forest capital'. As part of his study, Kessell inspected the Boyer Mill and bush operation:

The Boyer plant...rails logs in from virgin forest and saws them into cordwood of pulping size in its own sawmilling plant.

At the present time [Australian Newsprint Mills] is logging the forest practically on a face without forestry supervision. In the course of the operations good immature young trees are damaged and taken out and no adequate provision made for seed trees in the event of a heavy frost destroying the seed on the ground or the seedling crop before the trees reach the seed bearing stage...<sup>40</sup>

Kessell went on to suggest that the highest grade logs should be used for the production of high-grade sawn timber, with the 'pulp requirements [supplied] from off-cut material and second quality logs'. Reflecting the selective logging approach he stressed the urgent need for the 'education of bush workers in the protection of immature trees [in] falling operations.' He made further wide-ranging recommendations for the management of Tasmania's private and public forests, including the development of plantations.<sup>41</sup>

Two years later Kessell (after being initially offered a position with the Burnie paper mill), became General Manager at the company's Boyer Mill. His reserved nature contrasted with Benjamin's amiable manner. As a key figure in Australian forestry, Kessell was able to introduce many forward-looking approaches to forest management. These included planning for reforestation. In 1954 he initiated a series of post-graduate scholarships, the first being used by Max Gilbert who studied the life-cycle of the wet temperate forests of the Florentine Valley.<sup>42</sup>

#### Into the Florentine

After initial controversy, the company's men and machinery cut their way into the Florentine Valley. VIPs and industry representatives inspected the bush workings in the Florentine Valley. The general impression was that everything the company did was 'big' and at the forefront of industry change in Australia.

To gain quicker access to untouched forests of *E. regnans* in the Florentine Valley, the company decided to build a logging centre at the head of the Tyenna Valley. The camp was to be based on the facility already established for Risby's Basin, and similar to the Junee Camp. A rail-head for log assembly was expanded and known as the Marshalling Yards. Here a Depot with extensive workshops developed.

Access to the Florentine Valley was over The Gap, a high ridge separating it from the Tyenna Valley. In 1947 a railway was proposed and survey teams under legendary bushman, Mick Cashion, went into the wet forest. For a number of reasons, including the limestone geology of the area, the rail route was not feasible, and new technology from North America also dictated a change from rail to road logging. Neil Gibson, the engineer in charge of war-time logging operations and the railway survey into the Florentine, committed suicide. He was replaced by Dan Kitchener, his second in charge, a young energetic Victorian who favoured road logging. Kitchener imported other specialists into the State, including the first trucking contractors. The company gradually developed a network of roads for heavy trucks which brought the logs to the Marshalling Yards at the Maydena Depot where they were off-loaded by crotch-rigs onto trains for transport to the Boyer Mill.

The Florentine Depot also housed its own sawmills as the company was required to supply sawn timber and logs for the building industry under the terms of its concession. A sled or portable mill also cut minor species in the bush, while sassafras was supplied for peg-making.<sup>44</sup>

#### Two cultures in the valley

The Melbourne-based directors adopted a paternal approach to employee relationships, a pattern which had already been established in Tasmania by Cadburys and the Electrolytic Zinc Co.<sup>45</sup> While the Boyer Mill was being constructed, they

erected new suburbs for its workers at New Norfolk in 1940, and then built the new village of Maydena in 1948. Their interest in staff welfare was broad. In conjunction with industry unions, the company established its own medical and dental benefits scheme. Keith Murdoch had a strong interest in the arts and aesthetics; he was president of the trustees of the National Gallery of Victoria, and president of the Town and Country Planning Association. This interest continued at the new industrial development in Tasmania. He brought the Head Gardener from the Melbourne Botanic Gardens to New Norfolk in 1941 to advise on landscaping at the mill and the purpose built suburb. The same principles were later applied to Maydena where avenues of European trees (now mature) line its streets and the former Depot.



Figure 1: Maydena, the model town, 1952

In the formative phase before World War II, and during the conflict, the company had relied heavily on the skills of the local community. Post-war, the two cultures configuration of the company's work-force accelerated as it employed returning servicemen, plus interstate and international staff, particularly at a management level. In addition, the composition of the all male workforce widened, with 'outsiders' who were sometimes 'foreign' workers. These included migrants from Europe, one of the first being a group of twelve 'Balts', mainly Lithuanians, who arrived in Australia on the first migrant ship in 1948. They were followed by British, Czech, Polish and Italians, most being single men. An exception was the Serbian, 'Johnny' Pavlovic, a carpenter and truck driver, who married a Tasmanian. An unusual combination was Patrina Locher who arrived from London as bush nurse, accompanied by her Czech husband. Income levels

rose dramatically as Australian Newsprint Mills offered unheard of wages. One new employee took his first pay packet back, thinking there must be some mistake. An 'employment monoculture' developed, as traditional forms of employment such as the local hop-industry could not compete with the new wage levels.

The two social cultures were superimposed on the single employer, creating tensions and contrasts. They were reflected in the contrasting architectural styles of the old sawmill and farming villages of the Tyenna Valley, and the new company town. The old settlements of Fitzgerald and Junee were submerged in the 'New Town' of Maydena when construction started there in 1948. The orderly, repetitive character of the Maydena homes, which were of six basic configurations, contrasted to the (often tiny) individuality of the earlier sawmilling and settler's homes. The company magazine, referred to Maydena as the 'Model Bush Settlement Township of the Commonwealth'. 51 After a few homes were built by locals, Australian Newsprint Mills contracted Payne Pty Ltd of Hobart to erect prefabricated houses at the new town. Jack Pavne had worked with Hansen and Yuncken who built the Boyer Mill and a number of major Tasmanian buildings, including Wrest Point<sup>52</sup>, and the T and G Building, Hobart, which was Australian Newsprint Mills' first Head Office. The 'pre-fab' homes and the school<sup>53</sup> were assembled in the Hobart suburb of Lenah Valley and brought in 'kit' form on semi-trailers to the new township of Maydena. Their erection was recalled by Jack Payne's twin brothers Stan and Reg.54

Single men lived at Risby's Camp until a purpose-built housing complex called the Singlemen's Quarters was constructed by the company at Maydena in 1956. In addition, it funded the erection of other facilities including the Community Hall, Sports Ground and Swimming Pool. Houses were maintained by a company workforce.<sup>55</sup>

The village was constructed with a hierarchy typical of mining towns, with the Logging Manager's house, surrounded by other senior managers located on 'Snob Hill', as the locals referred to it. In addition to being the biggest house, the Logging Manager's residence was surrounded by an extensive garden with a variety of large trees. These homes overlooked the foremen's (who lived in 'Foremen Street') whose homes were physically above those of the bush hands, drivers and other workers. Contract truck drivers lived in a separate street.

Fallers, wherever they lived, were the new affluent elite, especially once the chainsaw arrived, buying new cars each year and dressing their spouses to reflect their new found wealth. Socially the men's private lives were an extension of their occupations as they congregated in the RSL Club in the same groups that worked together in the bush or Depot. Spouses became friends in the same circles.

Maydena developed a double sense of identity; the first based around the original settlers and the bush traditions which grew from the bush craft, and the second a culture of the new arrivals, many tertiary-educated. While the former were content to stay and live in the confines of the valley with its supportive ways, the latter had to 'get out' at regular intervals. Some of the new arrivals—who were invariably appointed to management levels at Maydena—sensed their

outsidedness, and identified that they had come as 'colonisers' as to Africa or the Pacific islands. <sup>56</sup> Some, like Graeme Sargison (a New Zealander) and Patrina Locher, found the local Tyenna Valley dialect difficult to understand. <sup>57</sup>

# New technology in the bush

While the locals and newcomers adjusted to each other, new technological changes were introduced. An extensive system of roads was cut into the concession. Trucks and crawler tractors became heavier and more powerful. The crotch rig and heel boom loaders were superseded by mobile Skagit loaders—four-wheeled cranes—imported from the USA. The greatest impact on men and the forest was the chainsaw. Reg Burns argued, 'The chainsaw murdered the bushmen,' as old skills learnt with the cross-cut saw and axe were dispensed with by a new generation of fast-working 'fallers'. Independent-minded bushmen and fallers were initially reluctant to wear safety clothing including ear-muffs and hard-hats.

Following the research of Max Gilbert and Allan Cunningham into the life cycle of *E. regnans*, new ideas on regeneration were implemented. As the forests were logged, the debris was cut, heaped into windrows, burnt and re-seeded. Tasmania's Forestry Commission established a Research Station at Maydena for its foresters to undertake their own field work. It became a model for similar centres elsewhere in Tasmania. A young Bill Mollison, assessed the impact of wildlife on seedlings, and suggested alternatives to poisoning, including the processing of wild meat. The company's foresters contributed to the discussion over forest management through professional papers. The Maydena operation was regarded as being at the forefront of forestry research in Australia, but in the concession, company foresters and workers in the Silviculture section felt themselves to be the 'poor cousins' in terms of priorities given them. The theory of regeneration viewed by the foresters and the practices undertaken by the company in the forest were often different.

## Maydena, 'the best place in Tassie'

Many former residents recall life in Maydena fondly as a close knit though hierarchical community, where doors and cars were never locked and children wandered the streets freely after school. A job 'for the boy'—but rarely 'the girl'—was never in doubt at 'The Print'. The Logging Manager, Dan Kitchener, was the unofficial 'Mayor of Maydena,' who decided which staff were allocated company homes and who was to be promoted—or sacked. He was also responsible for entertaining VIPs sent to the Florentine by Kessell's replacement at Boyer, the flamboyant Royalist, Rod Henry.

Maydena had over 50 clubs, often headed by Dan Kitchener, as patron or president. Newcomers were often the most active club members, except in those based on physical strength. The Maydena Axemen's Carnival was dominated by

company fallers who had moved to Maydena attracted by high wages. They included seven world champions, led by Doug Youd. Other clubs included football, cricket, badminton, and angling. The Maydena Players attracted new-arrivals to the stage and the Community Hall was packed by all for performances.

However, there were tensions underneath the affluent community. These included the dominant and damaging role of alcohol in the social life of many men, and a reckless regard for safety by others. This was not helped by the high injury rate typical of the industry of the time, reflected in the deaths of 15 men over the 50 year history of the concession, plus numerous severe injuries. In a reversal of most rural towns, the young men stayed for the almost guaranteed employment, while young girls left for Hobart. Many women experienced new interests, though most were the spouses of 'outsiders'. Some women felt restricted from socialising freely, as their role and the reactions of other women was predetermined by their husband's status within the company. The Country Women's Association attracted both new and old community members. The RSL Women's Auxiliary and women's groups in the Catholic and Anglican churches provided welfare for families in need.

#### Wind down

By the mid 1980s, Australian Newsprint Mills was part-owned by Fletcher-Challenge, the New Zealand pulp giant. Well before the environmental debate, the company gradually moved to reliance on regrowth instead of old-growth timber. With logs being trucked from other directions, and world newsprint over-supplied, the company moved for the shutdown of its Maydena operation in 1991. When the closure came, many staff were unprepared. All former employees regret the loss of camaraderie and community.

The majority of former employees moved from the district to retire or find work; some stayed with the company. Maydena now comprises a mixed community of retired employees, low-income families and a small number of families working in small businesses on contract to Fletcher Challenge. The former Singlemen's Quarters is an accommodation guest house and restaurant, catering for bush-walkers and tourists. A younger generation of bush workers is cutting minor species for builders and craftsmen.

One of the last acts of Australian Newsprint Mills as an entity occurred in 1998 when the concession was returned to the Tasmanian Government, 66 years after the first allocation in 1932. Although the 'coloniser' had left Maydena, the people and the valley had been changed forever.

## Acknowledgement

The project was commissioned by Forest Management, a Division of Australian Newsprint Mills which is now part of the Fibre Division of Fletcher Challenge. The Steering Committee included Curly Humphreys, Don Frankcombe, with

initial support from Graeme Ogilvy. Gaye Coleman acted as administrative coordinator. The tapes were transcribed by audio typist, Jan Horton. Thanks to several people for contributing to discussions, including Curly Humphreys, Kim Creak and Graeme Sargison, all foresters and former company senior staff. The author wishes to thank Australian Newsprint Mills/Fletcher Challenge for defraying costs in attending the 1999 Gympie Forest History Conference.

#### **Notes**

ANM = Australian Newsprint Mills Ltd and Australian Newsprint Mills Pty Ltd ANM/MP = Interviews Maydena Project

- 1 Since then 10 of the interviewees have passed away.
- 2 see Schama, Simon 1995. Landscape and Memory. London: Harper Collins.
- 3 Macfie, P. (forthcoming). Maydena, newsprint town. References to details in this paper are given in this forthcoming publication. The tapes, transcripts and photographs from the Maydena Project will eventually be housed in the Archives Office of Tasmania, together with early drafts of the book.
- 4 Rees, Leslie. n.d. c. 1953. Digit Dick and the Tasmanian Devil. Sydney: John Sands: 26-7.
- 5 MacFie, Peter. 1991. Mt Field—the Evolution of Tasmania's First National Park. Unpubl.report. Hobart: Department of Parks Wildlife and Heritage.
- 6 Watson, Ian 1990. Fighting Over the Forests. Sydney: Allen and Unwin; and Borschmann, Gregg 1999. The People's Forest. Blackheath, NSW: The People's Forest Press.
- 7 There is no doubt the Australian newspaper industry involved overseas interests in international paper, including Crown Zellerbach, but the motives of the Australian company still appear nationally competitive (see Dargavel, John 1995. Fashioning the Forests. Melbourne: Oxford University Press: 42). The New Zealand company, Tasman, an antecedent of Fletcher-Challenge, was involved from the 1940s, expanding its influence through the 1950s. see Marchak, P. 1992. Logging the Globe. Montreal: McGill-QueensUniversity Press: 222.
- 8 Apart from the Rawson thesis ending in 1955, no detailed study of the ANM's corporate history has been undertaken to date. Although ANM's corporate history was outside the scope of the Maydena Project, an understanding of corporate decisions, pulp production, and implications of these on logging operations and the work-force was necessary.
- There is apparently no evidence Aborigines occupied the Tyenna-Florentine area at the time of European settlement, see Ryan, Lyndall 1981. *The Aboriginal Tasmanians*. St Lucia: University of Queensland Press.
- 10 Love, A. 1986. The Journey to the Huon via Mt Field and Lake Pedder in 1837 by James Erskine Calder. *Tasmanian Tramp* 26: 11-17.
- 11 see Gowland, R. and K. 1976. Trampled Wilderness. Hobart: R. and K. Gowland.
- 12 G. Hocking 1978. in *The South West Book, A Tasmanian Wilderness*. Melbourne: Australian Conservation Foundation: 125.
- 13 Stokes, H. J. W. (Jim) 1975. The Derwent Valley Railway. Australian Railway Historical Society Bulletin. June: 125-42.
- 14 see MacFie, Mt Field op cit.
- 15 Garden, Don. 1998. Theodore Fink, a talent for ubiquity. Melbourne University Press: 227.
- 16 see Monks, John 1995. Elisabeth Murdoch: two lives. Melbourne: The Sun: 125-6.
- 17 Garden, op cit.: 228.
- 18 The Institute of Science and Industry, see Rawson, Jacqueline. 1953. A History of the Australian Paper Making Industry, 1818-1951. Unpubl. MA thesis, University of Melbourne: 60 ff.
- 19 ibid.

#### MacFie-Maydena

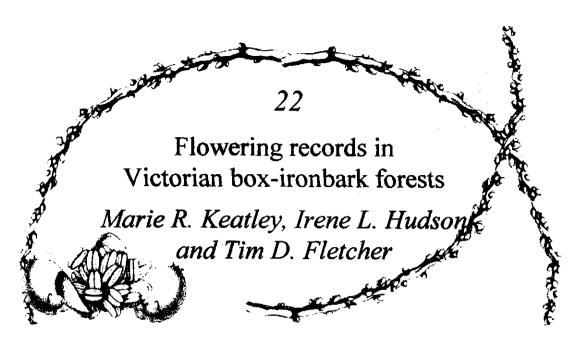
- 20 Son of Theodore and rival for Keith Murdoch for the head of the Herald and Weekly Times, see Garden op cit.
- 21 In 1932 the Collins groups proposal was based on the forests of the NW Coast. The company (APPM) had its mill built at Burnie in 1936.
- 22 Dargavel, J. B. 1982. The Development of Tasmanian Wood Industries: A Radical Analysis, Unpubl. PhD thesis, Australian National University: 168-9.
- 23 Rex Salter, bushman. ANM/MP. Rex joined the police force shortly after, recently retiring as inspector.
- 24 Garden, op cit: 230.
- 25 Gowland, op cit: 215-6.
- 26 Alan Rainbird, bushman. ANM/MP. Since deceased.
- 27 Dame Elizabeth's hands-on attitude was still apparent in a recent (1999) Australia Story, featured on the ABC, where she swept the floor of an art gallery prior to an opening despite being its patron.
- 28 They are the parents of media magnate Rupert Murdoch.
- 29 Rainbird, op.cit. (That is, 'You wouldn't buy something without looking at it first?')
- 30 Herald and Weekly Times Ltd 1952. Sir Keith Murdoch. Melbourne: the company.
- 31 Streets in the later township of Maydena were named after the earlier saw-millers.
- 32 Betty Barratt, miner's daughter, farm hand, tree-planter. ANM/MP.
- 33 Dennis Beattie, bushman, tractor driver. ANM/MP.
- 34 Gus Cashman, tractor driver. ANM/MP. Later salesman for William Adams, agents for Caterpillar tractors. Since deceased
- 35 George Watson, bushman/faller, road construction foreman. ANM/MP. The tree's demise was regretted and photographed by forester A.D. Helm in 1942. See photo in Borschmann, *The People's forest*, op cit: 69.
- 36 Meyer, Athol 1985. The Foresters. Hobart: Institute of Foresters of Australia: 53.
- 37 Evidence to the Commonwealth Rural Reconstruction Commission Appointed under the National Security Act, File No 1943/638, Australian Archives, ACT.
- 38 Carron, L.T. 1985. A History of Forestry in Australia. Canberra: ANU Press: 68.
- 39 Kessell, Tasmania, House of Assembly. Parliamentary Papers, 1945, no 42.
- 40 ibid.
- 41 ibid.
- 42 Meyer, op. cit.
- 43 Merv Burns. ANM/MP.
- 44 The Pioneer Peg Factory was eventually acquired fully by ANM, but closed in the late 60's due to competition from plastic and imported pegs.
- 45 see Alexander, Alison 1991. A Heritage of Welfare and Caring: the EZ Community Council 1918-1991. Hobart: Pasminco-EZ.
- 46 Australian Encyclopaedia, Vol 6: 188-9.
- 47 Tarvydas, Ramunas 1997. From Amber Coast to Apple Isle, 50 Years of Baltic Immigrants in Tasmania, 1948-1998. Hobart: Baltic Semicentennial Commemoration Activities Organising Committee.
- 48 Many European male migrants were called 'Johnny' by their Australian work-mates, partly from xenophobia but also to prevent embarrassment to both parties from a mispronounced name.
- 49 Johnny Pavlovic, truck driver and carpenter. ANM/MP.
- 50 Patrina Locher, bush nurse. ANM/MP.
- 51 Newsprint Log, Dec 1953: 18.
- 52 Later incorporated in the Hobart Wrest Point Casino.
- 53 Now the only such school extant in Tasmania.
- 54 Stan and Reg Payne, carpenter/builders. ANM/MP.
- 55 By the time these were built Sir Keith Murdoch had died, in 1951 and ANM's directions were in other directors hands.
- 56 Curly Humphries, pers comm; Kim Creak and Graeme Sargison, ANM/MP.
- 57 P. Locher, op cit., and G. Sargison. ANM/MP.

- 58 Noel Smith, machine operator. ANM/MP.
- 59 Reg Burns, bushman/faller, sassafras logger, contractor. ANM/MP.
- 60 Gilbert, J.M. 1958. Eucalypt-Rainforest Relationships and the Regeneration of the Eucalypts. Unpubl. PhD thesis, University of Tasmania.
- 61 Re-seeding changed from reliance on the natural shedding by mature seed trees on cleared forest, to hand-cast seeding and hand planted seedling and finally to aerial and automated sowing. Some hand sowing is still practised in 'blind' areas.
- 62 Done in conjunction with the CSIRO. See reports of Mollison held by the Forestry Commission, Hobart. Bill Mollison is today better known for his *Permaculture* concept of sustainable agriculture.
- 63 John Hickey, botanist. ANM/MP.
- 64 Byron Gordon, silviculture foreman; Mike White, forester. ANM/MP.
- 65 Byron Gordon, ANM/MP.
- 66 Bob and Mavis Wickam, truck driver and mother. ANM/MP.



# Understanding





### Introduction

Flowering times of eucalypts provide significant base-line information for a broad range of scientific disciplines e.g. pollination ecology, forestry and phenology (Burgess and Griffin 1991). Phenology is the study of the timing of recurring biological events and their causes with regard to biotic and abiotic forces. The vagaries of eucalypt flowering have been known at least since 1893 (Chambers 1893). Attempts to understand the major influences on this phenostage—a distinctive developmental event such as flowering—are not new (McLachlan 1909; Anon. 1921a; Robertson 1921). Periodically, renewed interest is displayed (Wykes 1947; Ashton 1956; Loneragan 1979; Dale and Hawkins 1983; Bassett 1995) even though the emphasis has been and is more often on nectar production or the enumeration of seed crop in relation to flowering. Few of these types of studies have been over an extended period of time (Ashton 1975; Porter 1978; Loneragan 1979; Dale and Hawkins 1983). Many are just 'snapshots' of a year or two (Fielding 1956; Hodgson 1976; Griffin 1980; Setterfield and Williams 1996).

The requirement for, and the importance of, long-term data sets for phenological and ecological events are well recognised (Franklin 1989; White 1995; Linkosalo et al. 1996), especially for those events that are rare, episodic, display high variability and/or complex phenomena (Franklin 1989; Tilman 1989). Long-term studies are also required for long-lived species in order to establish their natural history and reproductive biology (Valiela et al. 1989). Eucalypt flowering readily fits these categories. Specht and Brouwer (1975) believed that a minimum of ten years was required to account for the perceived variation and to outline any possible cyclical event in eucalypt shoot growth. The same rationale can be applied to eucalypt flowering. Fortunately, long-term records of flowering exist

and have survived, at least in part. The former Forests Commission of Victoria required the monthly recording of budding and flowering of honey producing trees in each district possibly from 1933 until 1978.

This paper has four objectives. First, it outlines the limitations, in general, of long-term records. Second, it details the history of the Forests Commission records. This is done so that their existence is documented and an understanding of their usefulness and limitations is conveyed. Third, it details how these long-term records have been used to quantify flowering behaviour and ecology of boxironbark forests near Maryborough, Victoria. Finally, it outlines the need for the development of policy and criteria, co-ordinated across all relevant government departments, to ensure the storage and preservation of such records.

# Limitations of long-term data

Long-term phenological studies can suffer, as may any long-term studies which primarily involve observation or monitoring, from the negative perception that the work is not real science (Findlay and Jones 1989; Taylor 1989). The limitations of phenological records are acknowledged. Often the number of plants are unknown (Hunter and Lechowicz 1992). There may be more than one observer over the time frame of the data set and the interpretation of a phenostage may differ between observers. Lastly, the collection of the data is not reproducible (Häkkinen et al. 1995; Linkosalo et al. 1996). Similar problems are encountered in the collection of meteorological data (Linkosalo et al. 1996). The long-term recording of temperature and rainfall in Australia has involved shifts in the location of weather stations, changes in observation techniques and in the instruments used (Power et al. 1998). Australian temperature records are less reliable prior to 1910 because of the different methods of instrument housing employed (Nicholls et al. 1996).

In both cases—weather and phenology—these limitations have not precluded the data from being used (Lindsey 1963; Loneragan 1979; Kramer 1994; White 1995). Purposes range from establishing the timing of budburst in temperate trees (Hunter and Lechowicz 1992), or determining whether changes in flowering phenology can be used as biological indicators of changes in climate (Walkovszky 1998), to determining the impact perceived changes in rainfall could have on agriculture (Mollah et al. 1991).

Methods to identify discontinuities or discrepancies in data have been developed for weather (Easterling and Peterson 1995) and phytophenology (Häkkinen et al. 1995), as have techniques to correct them (Häkkinen et al. 1995; Linkosalo et al. 1996). Using long-term phenological records (1896-1955) Häkkinen et al. (1995) developed methods to improve the reliability of phenological data series. These methods were refined by Linkosalo et al. (1996).

## Early attempts to quantify flowering

Qualitative studies on eucalypt flowering were undertaken in the early part of this century (McLachlan 1909; 1921).

In 1920 the Victorian Apiarist's Association, through the Department of Agriculture, attempted to quantify the flowering and budding periods of eucalypts and other honey flora of the state, by surveying beekeepers (Anon. 1920). Insufficient forms were returned to enable any quantification (Anon. 1921b). At the same time it also appears that the Minister for Agriculture offered to have the Forests Commission collect the relevant information:

I suppose they [the Forests Department] have never thought of studying it [trees] from a beekeepers point of view. However, we could help you [the apiarists] by adding it to their instructions (Anon. 1921a: 56).

The examination of trees from 'a beekeeper's view' does not seem to have been added to the Forests Commission's instructions after this meeting. Early (1935) quarterly budding and flowering forms, however, have a definite honey production focus.

In January 1930, the Forests Commission sent Circular 144 to District Foresters, requiring 20 specimens of each variety of eucalypt in a district to be labelled and observed, so that information could be collected on: 'the time of flowering; whether flowering is annual, biennial, or at longer intervals; the length of time elapsing between flowering and the ripening of the seed; and the effect of ringbarking on flowering and seeding'. District forest officers were also required to provide information on: 'the approximate average age at which each species begins to produce viable seed; the length of time eucalypt seed of different species retains its fertility after being shed; and whether viable seed is produced at each flowering'.

The circular was developed, after an inspection of 1926 regrowth in Erica by A.V. Galbraith, then Forests Commission Chairman (Youl 1929), where it was perceived that silvertop (*E. sieberi*) was out-competing the more commercially valuable white stringybark (*E. globoidea*). The purpose of the circular was to gain an understanding of eucalypt flowering and seeding with the aim of 'promoting the growth of better species' (Semmens 1929). Whether any information was collected under each of the above points is unknown as no records survive. It is also worth considering whether this circular was the genesis of Quarterly Budding and Flowering Reports (Forms 336 and 336A).

## Quarterly reports on budding and flowering of Eucalypts

These forms represent one of the few long-term records of a phenological process within Victorian forests and give a rare opportunity to understand a variable process such as eucalypt flowering. The surviving records cover 42 forest districts and range in length from less than 2 years to 42 years. The most complete records are for Barmah, Beaufort, Broadford and Maryborough. Of

#### Understanding

these Maryborough can be considered the least variable as there were only two observers covering the 38 year period, and only one record sheet of data was missing until 1971. Collection of data using Form 336 seems to have commenced in 1933 (Strahan 1935). The earliest surviving form is from December 1934. Form 336 remained in use until April 1959.

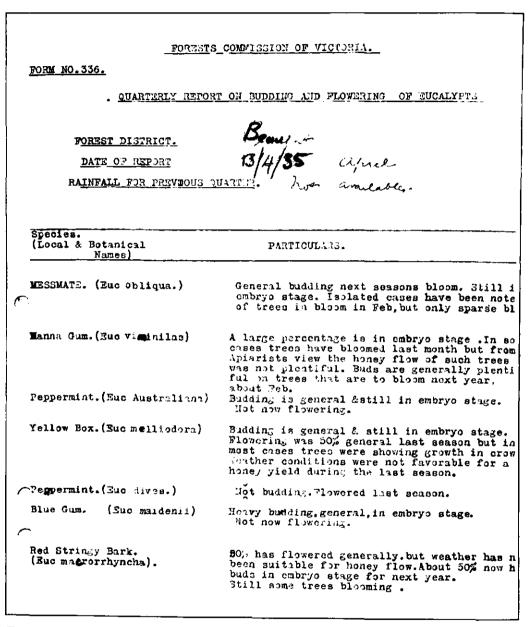


Figure 1: Form 336 from Beaufort Forest District dated April 1935.

These forms (Figure 1) listed the eucalypt species of the district and commented on the maturity of buds and flowers. Often the remarks seem to concentrate on the last month in a quarter. Instructions for quantifying the budding and flowering of eucalypts have not been located for Form 336. The terminology, such as 'Budding still in medium stage, heavy and general' or 'Scattered but heavy flowering', is very similar, however, to that employed in

Form 336A. The instructions issued with it have survived (Table 2). These earlier forms have a definite focus on honey production, as shown by the remarks taken from the 1936 correspondence between A. Young and Head Office: 'Re flowering data for species in this District, last year I wrote to you telling you that this district was not too good for Bee Keepers & you said this district would be struck off...'

brm No. 336A						
	FORESTS COM	<b>M</b> ISSION	- VICTO	RIA-		
QUARTERLY REPORT ON THE BUDDING AND PLOWERING OF EUCALYPTS.						
FOREST DISTRICT	2		· · Bazybe	atongh	•••••	
DATE OF REPORT			••••	/n/e0		
RAINFALL FOR PE	EVIOUS QUART	ER		52		
Species	BUDDING Condition of buds at end of quarter	per m	County of Cestond month	quarter Third month	Comments	
Red Irosburka	L.M.D.		×			
Ores Ses.	lo∭.v.	×	I			
Yellow Cum	8.N.3	4	2	x		
Yellow Box.	x	s.a.	#.9 <sub>0</sub>	E (	ompleted about middle	
Ned toxe	<b>x</b> .	L.S.	L.9.	×		
Res gume		E.G.	¥.º.	R. 3.	"	
Red Stringsbark.		ă E	<b>X</b>	M_7.		
Long lenf box.	我。我。话。	_	*	n.s.		
NOTES ON GROUND FLOR	AA AND ANY OT	HER REMA	kks:			
Continued ary weather has adversaly affected the flowering Of whrube. Homey flow ephears to be ebove everage.						
OR INSTRUCTIONS SEE BACK OF FORM.  Signature of Officer.						

Figure 2: An example of a typical Form 336A from Maryborough, 1960.

#### Understanding

Form 336A was introduced in April 1959 (Figure 2), streamlining the recording and reporting of budding and flowering. Symbols were introduced to represent previous terminology (Table 2). The absence of flowering and/or budding was ensured of being reported with this system. This form continued the practice of reporting the condition of buds at the end of the quarter. It codified, however, the recording of flowering for each month of the quarter, possibly replacing the perceived need for record sheets.

A copy of these records was kept at the originating office and possibly two copies were forwarded to the office of the Secretary of the Forests Commission. Forms were compiled into 'circulars' and then returned to 'Officers in charge of Districts and Plantations' each quarter.

'Circulars' were documents that provided detail about work practices and administration (McRae 1994). Circulars, in general, cover the years 1929-1959. The five surviving circulars relating specifically to the Budding and Flowering Forms cover the period July 1943-November 1944. Another forty-nine areas where flowering was observed are known from these circulars.

#### Record Sheets

Record sheets seem to be annual summaries, focusing on the range of flowering, listing the commencement, peak and cessation flowering dates of each species. The note at the base of the sheet also emphasised that the appearance of buds should be recorded. The earliest record sheet extant is from 1933 for Barmah. There are no surviving sheets beyond 1949.

The remarks section was often filled in with great detail and show by 1935, that although reproductive biology of eucalypts was still a focus, the production of honey was also a consideration, as shown below for the 1935 flowering of *E. rubida*.

White Gum (E. rubidia) [sic] 7th Oct, 30th Oct, 20th Nov,

Bloom was localised to Timber Reserve flats and was not of any duration as regards honey flow. Instances of tree showing three stages of budding were noticed and are worthy of note in that the buds for next years flowering were so advanced as to be easily mistaken for a late bloom in Febr [sic] or March 1936. The buds flowering this year were placed well back along the stem, away from the leaves.

The buds formed for next years [sic] bloom were placed normally where other species are set for the ordinary annual bloom, while the tiny buds in the 1st stage of growth weer [sic] placed right in the crown. I do not know this is usual with this species of the Euclypt [sic], as I have not observed it previously...

# The diaries of W.P. Sheen

The eucalypt flowering diaries of William (Bill) Sheen, Forest Overseer, Maryborough District (1934-1962) are described in this section. They are the basis in determining long-term synchrony, average flowering and flowering

behaviour indices, as discussed in the methods. Sheen's diaries provide the basis of the information for initial examination of long-term phenological records for the Maryborough region. The descriptive information in them covers the years January 1940-May 1962. An overlapping period (1960-1962) of completed 336A forms were retrieved from the Maryborough Office of the Department Natural Resources and Environment.

bata aftained drom Selection Observation Plots of marions ofices A. Box - Fruit about The same as last report. There are no signis of but. I. S. Rose\_ No further change in fruit cafende bud more developed, more gen and abundant. 4. Gum beginning to draf need . Other ends more material Isolated capacities of 2 merch show sign of ofening Flancing finished, bearing fruit exporter fairly well formed but not alundant. A. Gum The layest precentage of all first capsules have fallen from trees. Some trees whom lind . down next affect to begineal.

Figure 3: An example of a typical entry in W. Sheen's diary. Note that the title indicates that Sheen examined trees within selected plots.

The notes from the diary were transcribed and attached to the back of each form. This enabled a comparison to be made between Sheen's descriptive diary notes and the same data entered on the forms.

Sheen's main 'charge' was Havelock Forest Block as well as Majorca and parts of Craigie Forest Block (pers. com. A. Eddy, former District Forester at Maryborough 1992, and R. Sheen, second son of William Sheen, 1994). Plots were selected by Sheen, as is evident from entries in his diaries (Figure 3). Indications from the diaries are that the plots were in Havelock Forest Block. He appeared to have observed these plots on or about the 15th of each month.

#### Methods

The data from Sheen's diaries and Form 336A (July 1962-December 1970) have been compiled in order to examine long-term flowering behaviour of eucalypt species within Havelock Forest Block. All the *Eucalyptus* species observed by Sheen and the total number of 'present' observations for buds and flowering are listed in Table 1. This paper, however, presents the results for only four of the species—*E. leucoxylon, E. microcarpa, E. polyanthemos* and *E. tricarpa*—as they are representative of a common floristic community within the Havelock Forest Block.

Table 1: Species observed and number of individual 'present' observations

Name of Species	Species code	Number of individual observations over 30 years	
	_	Buds	Flowers
E. camaldulensis Dehnh—Red gum	RG	236	83
E. goniocalyx F. Muell. ex Miq-Long leaved box	LLB	202	55
E. leucoxylon F. Muell—Yellow gum	YG	150	208
E. macrorhyncha F. Muell. ex Benth—Red stringybark	RSB	266	128
E. melliodora A. Cunn. ex Schau—Yellow box	YB	231	132
E. microcarpa Maiden—Grey box	GB	112	104
E. polyanthemos Schau—Red box	ReB	266	96
E. tricarpa L.Johnson & K. Hill—Red ironbark	RIB	140	164

### Ranking data

Each of the terms which were used in the diaries and the Forms 336 and 336A to describe the condition of the buds and flowers were given a value as listed in Table 2. This enabled flowering and budding individual years to be graphed, and the average flowering intensity and cycles to be determined. The maximum value for budding was eight, which would equate to a heavy crop of mature buds generally spread across the sample plot. The maximum rank for flowering was five which would be the equivalent of general, heavy flowering.

#### Synchrony

Synchrony is the concurrent occurrence of a particular event being studied (Newstrom et al. 1994), in this case the occurrence of flowering. The degree of synchrony or overlap of flowering was determined using the method outlined by Augspurger (1983). The entire flowering period for individuals was used to examine overlap, as part of its purpose was to investigate the extent of possible hybridisation.

Table 2: Descriptive terms used in Form 336A and values applied to each

_	Symbol	Description	Value		
			Buds	Flowers	
Quantity	X	No buds/No flowering	0	0	
•		Very scattered or isolated*	0.5	0.5	
	L	Light Crop/Flowering	1	1	
	M	Medium Crop/Flowering	2	2	
	Н	Heavy Crop/Flowering	3	3	
Bud Size	1	Small (recently formed)	1	N/A	
	2	Medium	2	N/A	
	3	Mature (ready to flower)	3	N/A	
Distribution		Isolated*	0.5	0.5	
	S	Scattered	1	1	
		Fairly General*	1.5	1.5	
	G	General	2	2	

<sup>\*</sup> These terms and values were added to account for terminology used throughout the diary.

### Indices of flowering behaviour

These long-term records were also used to develop six indices of flowering behaviour for each of the species. The annual failure to flower probability is similar to the approach taken in flood frequency analysis (Institution of Engineers Australia 1987) and that of Porter (1978) in relation to *E. tricarpa* flowering. The probability of flowering in a particular month in a flowering year was also determined, as was the likelihood of flowering commencing and finishing in a particular month in a flowering year. Porter (1978) also quantified flowering monthly flowering frequency, but based on all years not just flowering years. Months of commencement and finishing were also detailed but the methods were not. The average duration of flowering when flowering commenced in a particular month was used and the average intensity of flowering for each month for flowering years was calculated, based on ranks.

### Results

The average flowering ranges of four co-occurring species when graphed together (Figure 4) indicate that overlap between all four species occur annually. The long-

term synchrony values listed (Table 3) confirm that all four species have been in flower together at some time during the thirty year period under examination. The low value (0.267) of the mean long-term synchrony, however, indicates that overlap between all four species is not a common occurrence.

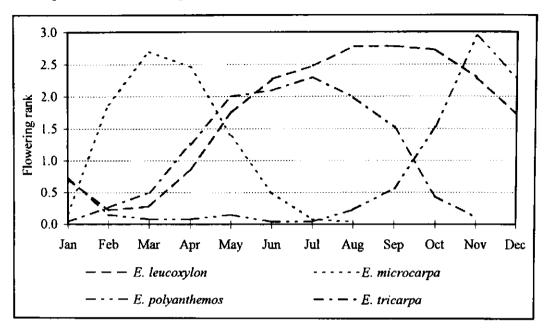


Figure 4: Average flowering (1940-1971) of selected species observed at Havelock Forest Block

#### **Synchrony**

The long-term overlap of species pairs indicates that hybridisation between the species—*E. leucoxylon*, *E. polyanthemos* and, *E. leucoxylon* and *E. tricarpa*—are the most likely to occur, with synchronies of 0.513 and 0.620 respectively (Table 3). The remaining pairs of species' long-term synchrony values suggest that hybridisation between these pairs should be considered as uncommon, but not impossible, as the maximum long-term values indicate that medium to high overlap does occur.

Table 4 further aids in the understanding of the long-term synchrony values between each of the species pairs, particularly those with low or very low synchrony values. It shows that each of the individual species within these pairs were often temporally separated, as species flowered at different times of the year or, one or both species failed to flower. Therefore, no overlap occurred on these occasions between the species. This is best illustrated by the least synchronous grouping—*E. polyanthemos* and *E. microcarpa* with a synchrony value of 0.056. In 25 of 30 years, the flowering range of these species did not overlap, even though both species flowered in 17 of the 30 years. This lack of overlap is an analogue for asynchronous flowering, therefore the very low synchrony of 0.056 is not unexpected.

#### Indices of flowering behaviour

Table 5 details the six indices of flowering behaviour for four of the eight eucalypt species, over a thirty-one year period (1940-1971). These indices enable quantification of the reliability of flowering on a year-to-year basis for the Havelock area. They can also assist in the management of nectar dependent species, by outlining the variation in food resources available or identifying the most appropriate time to re-introduce such a species to the area. The indices can also assist in the silvicultural management of Box-Ironbark forest, of which these species are representative. It should also aid apiarists in determining the most appropriate time to place their hives.

Table 3: Long-term and 1996-1997 synchrony values

Species code	-	1996-1997		
(see Table 1)	Mean	Minimum	Maximum	
YG, ReB, RIB, GB	0.267	0.189	0.591	0
YG, ReB	0.513	0.171	0.833	0.525
YG, RIB	0.620	0.367	0.909	0.811
YG, GB	0.294	0.172	0.694	0
ReB, RIB	0.128	0.134	0.533	0
ReB, GB	0.056	0.225	0.536	0
RIB, GB	0.357	0.225	0.778	0

Note: Each combination of species' lowest value was actually zero. This indicates that no overlap had occurred because one or more species had not flowered, or all species considered had flowered and no overlap had occurred; therefore synchrony was considered zero. The values presented in minimum long term synchrony are the lowest non-zero values.

Table 4: Years of no flowering overlap between species

	E. leucoxylon	E. microcarpa	E. polyanthemos	E. tricarpa
E. leucoxylon		10	5	6
E. microcarpa	5		25	10
E. polyanthemos	1	17		18
E. tricarpa	1	2	11	

Note: Upper matrix shows number of years of (n = 30) in which no overlap occurred between species. Lower matrix shows number of years in which no overlap occurred in years when both species flowered.

The Annual Failure to Flower Probability (AFP) gives an indication of the risk of not flowering. E. leucoxylon was found to be the only species which flowered each year in the sampling period, and in this context, is the most reliable. E. microcarpa may be regarded as the least reliable species, as it has failed to

#### Understanding

flower approximately once every six years. Each of the remaining species have failed to flower one year in eight.

Table 5: Examples of indices of flowering behaviour (blank cells = 0.00)

AFP	Annual failure to flower probability
M	Probability of flowering within a flowering year
C	" commencing flowering within a flowering year
F	" "finishing " " " " "
L	Length of flowering
I	Ranked intensity of flowering in a flowering year (max. = 5)
Shaded	Peak of ranked intensity of flowering in a flowering year
	Range of flowering

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
E. 1	leucoxy	lon	AFP =	0.00								
M	0.40	0.17	0.23	0.50	0.77	0.87	0.93	0.93	0.93	1.00	0.97	0.83
C	0.13		0.06	0.33	0.27	0.06	0.06			0.06		
F	0.17		0.03							0.03	0.17	0.60
L	11.5		10.0	8.80	8.60	7.30	6.50			3.00	,	
I	0.72	0.22	0.28	0.87	1.75	2.27	2.47	2.78	2.78	2.72	2.30	1.72
E. 1	microc	arpa	AFP =	0.16								
M	0.16	0.88	1.00	0.96	0.68	0.32	0.08	0.04				i
C	0.15	0.69	0.12		0.04							ļ
F			0.04	0.20	0.44	0.20	80.0	0.04				:
L	5.00	3.90	4.00		1.00							
I	0.16	1.88	2.70	2.46	1.38	0.50	0.08	0.04	<b>4</b>			
E. ]	polyanı	hemos	AFP =	= 0.13								
M	0.38	0.15	0.08	80.0	0.12	0.04	0.04	0.15	0.27	0.65	0.92	0.85
C	0.04				0.04			0.07	0.11	0.44	0.30	į
F	0.19	0.12	0.04		0.04				0.07		0.07	0.48
L	2.00				8.00			3.00	6.70	3.00	2.90	
· I	0.75	0.15	0.08	0.08	0.15	0.04	0.04	0.23	0.56	1.52	2.94	2.29
E. 1	ricarp	a	AFP =	0.13								
M	0.04	0.22	0.26	0.63	0.89	0.96	1.00	0.89	0.81	0.37	0.11	İ
C	0.04	0.19	0.04	0.37	0.26	0.07	0.04					i
F							0.11	0.07	0.44	0.26	0.11	
. L		9.00	9.00	6.10	4.70	3.00	4.00					
	0.04	0.26	0.50	1.26	2.00	2.09	2.30	1.98	1.52	0.44	0.11	

Table 4 indicates that for each of the other indices presented—M, C, F, L and I—E. microcarpa had no flowering activity recorded in spring. The index M indicates the probability of a species flowering in a particular month in a flowering year. A value of 1.00, as found in E. leucoxylon, E. microcarpa and E. tricarpa, indicates that flowering has always occurred in that month within a flowering

year. The maximum probability for *E. polyanthemos* of 0.95 means that, despite the high probability, in a flowering year no particular month is assured of being 'in flower'. In all species except *E. leucoxylon*, the maximum probability of *M* was associated with peak flowering intensity.

The indices C and F—commencement and cessation of flowering—identified the likelihood of these particular phenostages occurring in any particular month in a flowering year. In no species were either of these events confined to one particular month or season. A more probable month, and therefore season, of commencement and cessation was highlighted for most species. In all species winter was not a preferred season. E. microcarpa clearly had a preferred month of commencement, February, with a probability of 0.69. Cessation of flowering was most clearly defined for E. leucoxylon, in December, with a probability of 0.60.

Commencement and cessation also define the most probable range of flowering (indicated by the square brackets in Table 5). This range is different to the index length of flowering, L, which considers the duration of flowering in relation to the month of commencement. The range indicated by the brackets also coincides with a probability of greater than 0.50 for flowering in the given month for each month in the nominated range. January is also highlighted as the month when flowering is unlikely to occur.

The length of flowering, L, determined how long a species remained in flower, depending on the month it commenced flowering in. It was that the earlier flowering commenced within a species, the longer the duration of flowering. For example, if E leucoxylon started to flower in March, flowering lasted for ten months, but if flowering started in December it lasted for just over seven months.

The average intensity of flowering for each month, *I*, was also quantified. In two of the four species, *E. microcarpa* and *E. polyanthemos*, the most probable time of commencement was one month prior to the month which displayed the greatest flowering intensity. This indicates a very rapid production of flowers. The intensity of all species was between 2.30 and 2.94, equating to a light flower crop distributed fairly generally throughout the plots. All the species considered here reached peak flowering in different months throughout the year.

### Discussion

The history of the Quarterly Budding and Flowering Reports have been presented to document their existence, as well as to convey an understanding of their usefulness and limitations. They may be viewed as part of our scientific memory. By knowing how species behaved in the past, we have a better chance of understanding the flowering that is being observed now, or how the species may react to change in climate in the future (Sparks 1999).

#### Uses

The limitations of long-term phenological data have been acknowledged (Hunter and Lechowicz 1992; Häkkinen et al. 1995; Linkosalo et al. 1996) but they have

not precluded this data from being used (Lindsey 1963; Hunter and Lechowicz 1992; Kramer 1994; White 1995). Nor is the use of historical data restricted to plant phenological studies. Studies have used this type of data to determine the spring migration of the damson-hop aphid (Worner et al. 1995) and changes within bird migration patterns (Sparks 1999). Long-term flowering data have been employed as a biological indicator of climate change (Walkovszky 1998; Spano et al. 1999). This paper has shown that long-term data can be used to establish a base-line of flowering synchrony between species, enabling current overlap to be judged in light of this as well as quantifying flowering behaviour.

### **Synchrony**

Quantification of overlap either between or within eucalypt species has not occurred in many studies (Rogers and Westman 1979; Griffin 1980). A view of the long-term synchrony of eucalypts has not been reported to date. Long-term synchrony values established a base-line of flowering behaviour, enabling current overlap to be judged in light of this. While the 1996-97 synchrony values and therefore flowering cannot be considered average, none of the current synchrony values were outside the long-term range. Consequently, the 1996-97 flowering can be considered as representative of the variation that occurs in eucalypts.

The use of long-term records and synchrony values also add further explanation to the low records of hybrids in eucalypts (Griffin et al. 1988) and illustrate the degree of competition for pollinators between species.

### Indices of flowering behaviour

The variability of flowering within individual eucalypt species has been commented upon since 1893 (Chambers 1893). The indices presented here enable quantification of this variability. Quantification of annual eucalypt flowering as well as delineation of commencement and cessation months using long-term records was first applied by Porter (1978). Porter expressed annual flowering as a percentage of years in which flowering occurred, quantifying flowering success, whereas the methods here quantify flowering failure. The monthly flowering frequency appears to have been calculated by Porter using both flowering and non-flowering years. Exactly how the months were delineated, however, was not given.

For Havelock Forest Block the index AFP, indicated that E. leucoxylon was the most reliable species. This, coupled with its length of flowering, indicates that for nectar dependent species this is the most significant species. Across all species January was shown to be the least likely month in which flowering would be observed. The index C, showed that the probable time of commencement of flowering was the month prior to peak flowering in the majority of species. This indicates a very rapid production of flowers. In E. leucoxylon the longer time interval between commencement of flowering and peak flowering highlights a slower production of flowers. Months of peak flowering for each of the species were clearly separated, this reduces the competition for pollinators and the possibility of hybridisation (Griffin 1980).

Generally, the earlier that flowering actually commenced in the range nominated for the commencement of flowering, the longer flowering went on. The cessation of flowering occurring at a particular time, regardless of the time of flowering commencement, indicates that there is an optimum time to finish flowering. The flowering behaviour indices outlined for the four species of eucalypts are readily transferable to other tree species, if a long enough record exists.

### Record length

The length of record which is defined as 'long enough' is in itself debateable. This is often reflected by convention within a branch of science and constrained by funding bodies, government policy and management decisions and the general community. Thirty years has been suggested for rainfall records and five to ten years for temperature data (Bureau of Meteorology 1988). This difference in the time frame considered adequate to obtain stable statistics reflects the variability within the data that are collected.

A minimum of five years has been suggested to describe the variation in tropical flowering phenology (Newstrom et al. 1994). For eucalypt shoot phenology, ten years has been nominated as the minimum time to outline the variation of this phenostage (Specht and Brouwer 1975). Very few field studies (<1.7 per cent of 749 papers extracted from *Ecology* over a ten year period (Tilman 1989)) have been continued for periods longer than five years. Tilman, after examining the few long-term studies, suggested that even five years may be too short. In determining cyclical events in weather, the length of data is recommended to be four times the length of the cycle (Griffiths 1976).

The indices derived for flowering behaviour, using the record of flowering within the Havelock Forest Block, are adequate using any of the above criteria.

## Conclusion

Detailing the flowering behaviour and the long-term synchrony of these species, which add to the understanding of the reproductive ecology of these forests, would not have been possible without these long-term data. These data were rescued from being destroyed at the time of amalgamation of the Forests Commission, Department of Crown Lands and Survey, the Ministry of Conservation and some of its agencies in 1983. They were regarded as no longer valuable, possibly because they no longer met management needs.

The value of historic data has been noted by other authors. Sparks (1999: 137) lists points pertinent to this paper; the need for preservation of all historic data and its recording in digital form. This paper wholly endorses these sentiments and reiterates the need for the development of policy and criteria, co-ordinated across all relevant government departments, to ensure the storage and preservation of such records. We must do this so that our ability to manage forests in the future is not limited by our ignorance of the past.

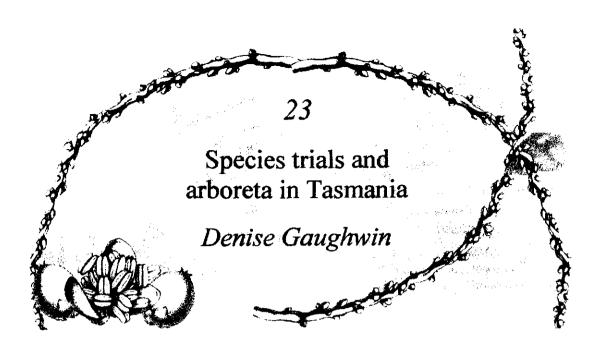
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#### Introduction

Since the 1920s the research undertaken by foresters has played an important role in creating the present forest resource. The selection of species to be planted today and their silvicultural treatment is based on the knowledge acquired by earlier generations of foresters. When the first research trials were conducted, the method most used was to set aside areas for test or 'trial' plantings of a variety of species. In some places only a few trees of each species were planted in 'arboreta', but in others 'trial plots' of each were planted. These plantings involved selecting species, soil types and altitude and keeping records on the growth and condition of the trees. Trial plantings and arboreta in Tasmania date from the 1920s with the establishment of the Forestry Department. Two major periods of development of this type of research can be delineated; the initial Department years, and prior to and after World War II. Differences in aims can be discerned with the early period being primarily concerned with reafforestion and research and the latter period with the establishment of a softwood resource.

The study reported in this paper arose from the need to manage Tasmanian wood production forests when several trial plots were scheduled for redevelopment as plantation. Without a knowledge of their history it was not possible to assess their significance and therefore decide their management according to the principles of the Burra Charter (Walker 1992). The history of the plantings had become lost to all but a few in the industry and much of the documentation has not survived. The most accessible material was used to explore the problem; Annual Reports of the Forestry Department and Forestry Commission, records in District offices, where available, and interviews with long-serving forest officers. The main emphasis of the study was to prepare an inventory of the

location of the plots, when they were planted, what species were included and, if possible, determine why they were developed on the selected sites. The records of subsequent management and growth were sought and summarised where they were available.

Initially the focus of the study was to be only on the arboreta. These are the formal places where different species are planted and intended for long term study. However as the research progressed it became clear that there has been blurring between these places and a number of the surviving species trial plots and experimental plots. Some species trial plots, now long neglected, have become thought of, at least locally, as an arboretum. In some instances trial plot planting maps included an area specified as an arboretum within the plantings. In other cases whole plantations were monitored for growth but these have not been included. The focus is on those areas that were designated and developed as research plots whether as arboreta or species trial plots.

## **Background**

The settlement of Tasmania by the British from 1803 has left a rich legacy of exotic plantings. Official plantings in the towns and convict settlements were always part of the strategy of claiming the land and remaking it as their own. One has only to visit Port Arthur or the public spaces in Hobart or Launceston to see the result of these plantings. The settlers were also engaged in planting their house blocks with a variety of European trees as well as planting wind breaks and fences. These activities are more in the domain of creating pleasing land-scapes than experiments in growing trees for timber purposes. In the first hundred years of British settlement experimentation was focussed on food trees, particularly fruit and nut species. Orchards were an integral part of most of the large farming properties.

Tasmania's native forests were viewed as a nuisance, a barrier to successful farming. The pattern of British settlement followed the open woodlands through the Midlands, parts of the East Coast and the Fingal Valley. These were desirable sheep country that required little clearance and could quickly return an income by sending the wool to the industrial heartland of England. However, by the 1850s these were all taken up and a new group of settlers desired land. Various Government Acts were passed to open up the unsettled districts which led to the ringbarking and subsequent clearing of the great forests on rich basalt soils in the Scottsdale, Devonport and Smithton areas. Some of the best forests were ring barked and burnt as small farmers developed their properties. Very little of this timber was salvaged for industrial purposes (see e.g. Fenton 1891, Hookway et al. 1981).

The final attack on the forests came with the development of the soldier settlement scheme after the First World War. Many areas of forest that had not been considered by prospective farmers as worthwhile previously, were now opened up for settlement. While the landowners worked hard to clear the allocated land and make a living they were fighting a losing struggle in many places

where the parcels were too small and/or the soils too poor and/or the altitude too great to allow for small-scale farming. They left the land in large numbers leaving a denuded landscape behind.

Other large tracts had been denuded by the activities of miners, particularly the alluvial tin miners of the north-east. Between 1870 and 1900 timber was burnt, pushed aside or used for construction of water races, mine props, sluice boxes and domestic shelters as the miners sluiced the mineral rich areas. In mines with elevators or underground shafts the steam engines that serviced these processes used large amounts of timber (Gaughwin 1996).

# **Development of professional forestry**

Tasmanian hardwoods were exploited for sawn timber, poles, piles, shingles, palings and firewood for domestic use and for export, mostly to the mainland (Dargavel 1982). Softwood was also required. Huon pine was sought for joinery, furniture and especially for wooden boats but the resource was exploited very heavily and after a peak in the 1920s it became difficult to supply the demand (Bannear 1991).

The arguments for forest conservation and management advanced within Australia and by visiting imperial foresters—notably, F.D'A. Vincent in 1887, B. Ribbentrop in 1895 and D. Hutchins in 1914, who gradually persuaded each State to pass a Forests Act, dedicate State forests and establish a forestry service to manage them. The Tasmanian Forestry Department was established finally in 1920. A Conservator of Forests, L.G. Irby, and the District Forestry Officers, M.R. Garrett and J.M. Firth, were appointed and a new regime began in the State. What they thought of the situation of the forests can be read in the Annual Reports of the Forestry Department. These reports reveal their outrage at the state of the forests. After 100 years of largely uncontrolled timber harvesting the forest estate was seen to be in a devastated condition. Land clearance on ground unsuitable for farming added to the problem. The Department set about assessing the state of the forests by taking inventories of the 'waste lands', researching the planting of exotic species of softwoods and gaining a better understanding of native forest silviculture.

These foresters did not come out of a vacuum. They had gained experience in other States and were in contact with their interstate colleagues. Attendance at foresters' meetings and collecting a library of forestry developments throughout the world was part of their professionalism. In doing this they were following the developing principles of forest management, as espoused by Schlich (1922) for example, and were part of an Empire wide effort to improve the forest estate and its long-term management. That Tasmania was relatively late in developing its policy is clear from the summary of forestry in Australia provided by Schlich in 1922 (247). Tasmania is the only State for which there is no summary on the grounds that 'there are not sufficiently accurate data available to give a detailed account of Forest operations in Tasmania'.

The first problem encountered in developing the experimental plots was obtaining seed. In the early days nursery seed was not available in Tasmania but was obtained from local garden plantings and from colleagues in other States and in New Zealand. The 1923 Annual Report states that:

Trial beds have been established from seed of mature trees at Deloraine of Pinus insignis as well as Pinus muricata (Bishops pine), Pinus strobus (Weymouth pine), Araucaria bidwilli (Queensland Bunya pine) and a small amount of New Zealand Pinus radiata. The Bunya are doing very well as are the other varieties although the New Zealand seed all proved very poor in germination.

A Departmental nursery was set up at Sisters Hills in 1923. The species indicate a concentration on pine species with *Pinus insignis* (now *P. radiata*), *P. pinaster*, *P. ponderosa*, *P. laricio*, *P. excelsa*, as well as *Abies douglasii*, *Larix europa*, and *Cupressus macrocarpa*. It is unclear where the seed was obtained, but the numbers of seedlings, e.g. 250,000 *P. insignis*, suggests that it may have been purchased from nurseries interstate or in New Zealand.

The next development saw small acre experimental plots planted on different soil types. This phase was seen as preliminary to the establishment of larger plantations. The following quote gives some understanding of the thinking behind the developments:

In the establishment of plantations of exotic softwoods much experimental work has been necessary in order to determine whether certain types of more or less waste country could not be brought within the bounds of productivity (Annual Report 1929).

In 1925 one of the few experimental plots to explore the properties of native species was reported as follows:

A commencement has been made with the establishment of sample plots for the purpose of obtaining statistics relative to the rates of growth, annual increment, response to treatment of various species of our timber trees etc. So far the plots have been established in three forestry districts, the species being blackwood, (Acacia melanaxylon), stringy bark (E. obliqua), and white gum (E. viminalis). As regards the eucalypts, plots have been measured of sylviculturally treated areas and areas left in the natural condition.

These plots were, however, placed in existing forests and were not trial plantings. The early plantings appear to have been the domain of the softwood species. The experimental plantations of 'valuable timber species' replace this early interest in native species and while some interest was continued in the improvement of the native forests the emphasis returns to exotic trees.

The earliest arboretum was planted at Sheffield in 1925 as the *Annual Report* (1926: 5) states:

An arboretum of 20 acres [8 ha], within the Sheffield plantation has been laid out and fenced. It is proposed to plant therein as many different species as can be obtained. A start has already been made and 1000 trees planted including Pseudotsuga douglasii, Picea sitchensis, Picea excelsa, Larix

europa, Sequoia sempervivens, Araucaria Iaricio, Pinus insignis, and Pinus pinaster.

The next year this arboretum was extended to 24 acres [10 ha] and Norway spruce, Scotch pine and the Corsican pine were added and there were spot plantings of *P. canariensis*, blackwood and black wattle. This arboretum is still standing although there was some cutting of the *P. radiata* around 1980.



Figure 1: J.M. Firth measuring a 4-year-old tree in the Beaconsfield plantation, 1927. (Forestry Tasmania, Library Collection)

Although the Forestry Department undertook most of the plantings, companies were doing similar work. An arboretum was planted in 1935 at Hollybank, just outside Launceston, as part of an ambitious venture to grow an ash plantation for tennis rackets. The venture failed and the Forestry Commission took over the property in 1955 (Forestry Commission 1985) and turned it into a Forest Park for recreation purposes. Trial plantings were also being undertaken by the large-land owning timber companies including the precursor of North Forest Products which started an arboretum at Ridgley in the 1950s. The innovative role that one interested forester can play is highlighted, oral traditions tell,

by D. De Boer who began the Ridgley plot without any authority from the managers. It was here however that *E. nitens* was proven to be such a fast growing species that the knowledge changed native species plantation practices.

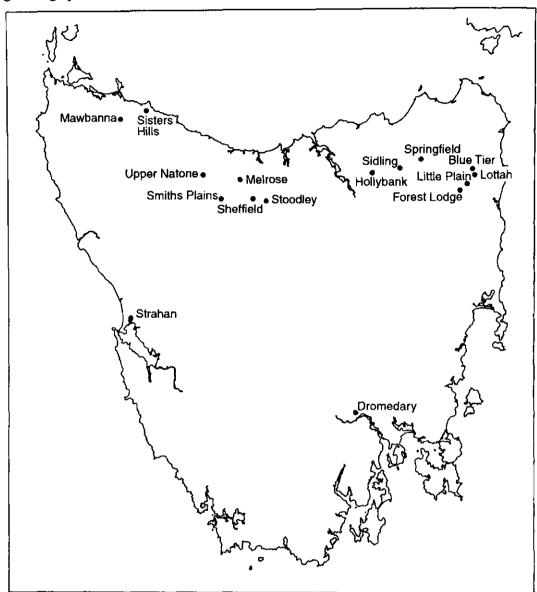


Figure 2: Location of arboreta and species trial plantings in Tasmania

# Location of research plantings

A summary of the known locations of the plantings is provided in Figure 2 and Table 1. There were two areas targeted that appear to be separated chronologically. It is clear that it was thought that the native grasslands and button grass plains could be planted successfully if a suitable species could be identified. These 'wastelands' around Sisters Hills and Strahan were the centre of attempts to develop plantations. Nurseries were established and large areas

prepared for plantation. There seems to have been a view held that if only the right species could be found this unproductive land could be redesigned as useable forests. Unfortunately the lack of knowledge of the soils and drainage and the large establishment costs made these initial experiments unsuccessful (Cubit 1996: 90).

Table 1: Summary of the location of the species trials and arboreta

Name	Region	Date planted	Altitude (m)	Prior land-use
Sisters Hills	North-west	1926		Grassland
Sheffield	North	1926	265	Farming
Strahan	South-west	1926		Grassland
Mawbanna	North-west	1930/1944	91	Farming
Hollybank	North-east	1935	366	Farming
Stoodley	North	1938/1946	265	Farming/native forest
Urana	North-east	1943	457	Native forest
Sidling	North-east	1944	549	Farming
Forest Lodge	North-east	1945	640	Farming
Springfield	North-east	1945	182	Farming
Upper Natone	North-east	1945		Farming
Smiths Plains	North	1946	549	Farming/native forest
Blue Tier	North-east	1946	701	Mining
Little Plain	North-east	1947	610	Farming
Melrose	North-west	1947	61	Native forest
Lottah	North-east	1947	305	Mining
Ridgley	North	1950	274	Farming/native forest
Dromedary	South	1990	274	Native forest

The later period, that dates from the late Depression to after World War II, sees some emphasis on the reclamation of abandoned farmland, usually referred to as 'devastated' lands to separate them from the 'wastelands' described above. Devastated lands were those that had been cleared of native forests in earlier years and especially for Soldier Settlement after World War I. These areas proved too marginal for small-scale farming and were often abandoned or sold cheaply by the landowners. Efforts by the Commonwealth to increase Australia's softwood estate supplied some funds to develop plantations on these lands. The trial plots were an important step in the larger scale developments that were policy at both State and Federal levels.

The biggest period of development of trial plots comes after World War II when the initial impetus came from the Post-War Planning Branch that had been set up in 1943 with A.D. Helms in charge. This branch was established to develop a programme to provide work for the large numbers of men that were thought to be available for forest work after the 'cessation of hostilities'. The Branch set about mapping and examining the 'devastated lands' to determine those which could be rehabilitated. In the words of the 1944 Annual Report:

large areas which should have been retained under forest have been selected and cleared for agricultural or pastoral development. Hundreds of thousands

of acres of such lands have eventually been more or less completely abandoned and the State is now faced with a serious reclamation problem. The examination and mapping of such lands is the work of the recently constituted Post-War Planning Branch.

Interestingly, it was observed in the 1946 Annual Report that the returning men did not seek out work in the forests and the smaller work force was generally employed in fire protection and road construction rather than plantation development.

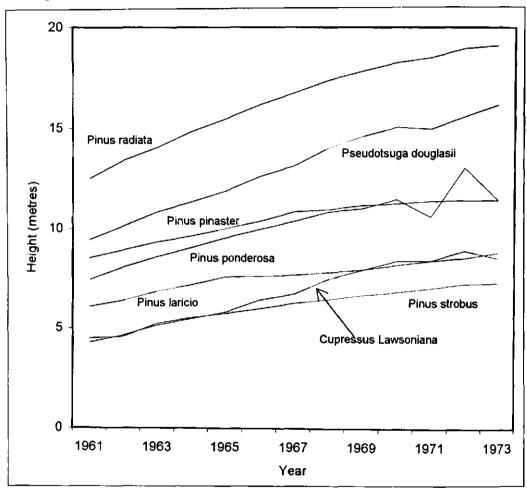


Figure 3: Blue Tier Plantation yield record, 1961-73

The records of the establishment of the species trial plots by the Post-War Planning Branch have been difficult to locate. The exception to this was in the north-east at Scottsdale where the original register for the years 1945 to 1954 was retained. These records inform us of how the plantings were made for five trial plots at Blue Tier, Lottah, Little Plain, Forest Lodge and Urana, as well as the Sidling arboretum. These surviving records indicate that the main aim was to test the growth of conifers on the higher altitudes with some experimentation on the granite soils.

The method of establishment is described and a range of ground preparation was completed for the plantings. Most often, after rough clearing, spades were

used to 'hole out' the ground and plant the trees at 6 ft by 6ft [1.8 x 1.8 m] spacing. Some areas were fenced with rabbit netting with barbed wire on top, while others were not fenced. Burning the cleared ground does not seem to have happened as a norm but was mentioned in one instance. The greatest preparation was undertaken at the Sidling arboretum which was disc ploughed and fenced with rabbit proof fencing.

Records of the growth were made at roughly two-year intervals. This was continued in the record book until 1954 after which there are no new entries. The earlier records made notes on survival and growth indicators. The survival rates of individual species were noted, the height of trees measured and notes made on the colour and condition. Removal of species that were unsuccessful was also noted. These were generally replanted with the successful species and most often with *Pinus radiata*. Overplanting was also undertaken in some instances. The biggest problem appears to have been with rabbit browsing as nearly all species were effected to some extent. Wind exposure caused the next greatest loss of trees at altitudes under 1500 feet [490 m].

In 1961 measuring recommenced but was now concentrated on only a few of the species planted. These continuation records were filed on plantation yield plot sheets, only a few of which have been located so far. Measuring in arboreta continued until 1973 when the Chief Commissioner, P. T. Unwin sent a memo that no more remeasurements were to be carried out. Records of some plots have been located in the Bass District office. The most complete of these are for the Blue Tier species plot and cover the 28 year period for trees planted in 1945 and measured between 1961 and 1973 (Figure 3). The graph clearly illustrates the relative growth of the species and the success of *P. radiata* at these altitudes.

The species that were planted further illustrate changes in emphasis over time from the eclectic initial period followed up by an emphasis on the development of a successful softwood plantation resource. The full list of species that was planted is appended. It is clear that there was little discrimination in the early plantings where any species that could be obtained and were known to have some commercial value were used. Later there is a narrowing of selection of species to those illustrated by an asterisk that were included in the plots developed by the Post-War Planning Branch.

## Other types of trial plantings

An interesting finding in this work was the number of other plantings that were being undertaken over the period. As the nurseries began to produce seedlings these were made available to schools across the State. School plantings were made as part of the desire to improve education in forestry. For example an entry in the *Annual Report* for 1924 informs us that Arbour Day was celebrated by Scottsdale for the first time and proved an undoubted success:

A number of insignis, macrocarpa, douglasii, and ponderosa were obtained from the Department nursery at Sisters Hills and were planted in the High School grounds by prominent people of the District and also by the scholars.

#### Understanding

Later a more adventurous scheme was undertaken. In 1928 the school established a plantation of some 40 acres [16 ha] on ground given to it by the Closer Settlement Department.

It was clear that this development was seen to have long term benefits of a promotional nature for the Department (Annual Report 1928):

It is proposed to establish an arboretum in connection with the plantation to be devoted to Tasmanian trees and shrubs. The establishment of this plantation should instill an interest in forestry in the rising generation...

Commemorative plantings have been noted in a number of places. Exotic trees were planted to commemorate individual foresters such as Joseph Memory Firth who was the first regional forester in the north-east. Another example is the avenue of alternate Douglas fir and Western red cedar on the roadside of the Stoodley plantation made to commemorate the work of the Conservator of Forests, S. W. Steane. Interestingly, it was not only the senior officers that received these honours. The men who planted the Saddleback plantation in the north-east in 1968 were given a memorial planting of Douglas fir with each tree bearing the name of one of the gang. Obviously the industry is demonstrating pride in the efforts of its workers and the planting of trees is one of the honours that it can bestow upon them.

## **Current situation**

Today most of the trial plots described here have survived. One has completely disappeared after regular burning by local residents, one has been harvested and replanted with plantation. The others survive in various states. All have been neglected in terms of their long-term management as trial plots. Little thinning or pruning has been undertaken. District staff recorded the state of the Mawbanna planting in 1985. They describe a plot infiltrated by eucalypt and blackwood as well as dogwood/musk/bracken scrub. While many species had disappeared and some had only a few poor specimens surviving, the survival of some species—notably Cedrus, Callitris and Sequoia—was impressive. Pinus monticola, P. laricio, Thuja plicata and Cupressus arizonica had grown to heights of 20 metres but were branchy and needed to have been pruned many years earlier.

The most common fate for the plots that are managed is to become picnic places. This has tended to happen to those with proximity and access to regional population centres. For example, the Springfield Forest Reserve has the full range of barbecue facilities as well as 'arboretum walks'. Other picnic projects are associated with Hollybank and Upper Natone while parts of Stoodley are developed as a forest walk.

# Significance of the plantings

Finally we appear to be in a position to assess the significance of the arbore-tum/trial plots in the developmental history of the forest industry in Tasmania. Their main significance is as the visible indicator of the long history of research that has led to the development of today's forest estate. Those trees grown in plantations now are those that were the success stories of the research trials. While much of the associated paper records have not survived to inform us of these efforts, the maturing arboreta and trial plots are standing reminders of these research efforts. They are a physical reminder of the professionalism of the early foresters who had to start from a very low knowledge base to develop a production forest. These methods have been replaced and the decisions about the suitable species have been made, but the arboreta remain to inform of the progress of the slower growing species. For this reason they have historic significance as being representative of a system that is no longer practised.

The age and mix of species makes these places aesthetically pleasing. This is partly the reason some have been developed as picnic spots. In a State that has a predominant native forest landscape, the arboreta can inspire thoughts of other exotic landscapes. Older foresters who have been involved in the development of the places or watched their growth over decades often attach social values to them; they have social significance.

#### Conclusion

This paper has only skimmed the surface of this important part of the developmental history of the forest industry in Tasmania. There is a much more detailed story that could unfold with more archival searching and a programme of oral history interviews. However much of the story could be told by the trees themselves by field investigators who are skilled in measuring and assessment of exotic species. The retention of the trial plantings identified here is necessary to allow this narrative of forestry research to be completed. The industry has a visible record of the efforts over 75 years to develop a forest estate illustrated in the arboreta and trial plantings. It was from these efforts that the current forest estate evolved, successful species continue to be planted in plantations while the slower growing species remain only in these trial plantings and arboreta. Experimentation with other species survives only as paper records. It is hoped that more of the records will be located as a by-product of this research.

## Acknowledgements

The task of locating District records would not have been possible without the help of Forestry Tasmania staff: Sean Blake (Bass), Joe Hawkes and Neil Denney (Mersey) and Dennis Chester (formerly of Mersey). I would also like to thank Chris Mitchell, Forest Practices Board, for useful comment on a draft of this paper and Richard Hart, Private Forests, for assistance with species names.

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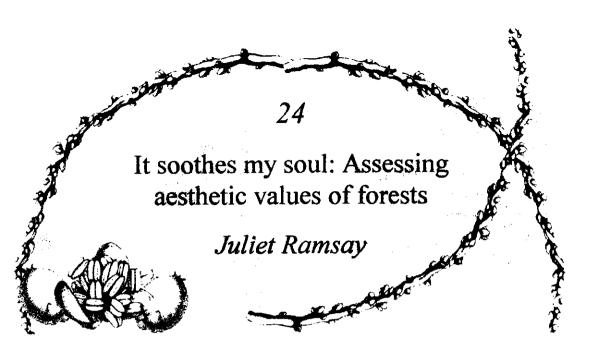
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# Appendix: List of species

Plots	Scientific name	Common name
	Abies alba	European silver fir
	Abies amabilis	Red silver fir
Post-war	Abies nobilis	Noble fir
	Abies nordmaniana	Caucasian fir
	Abies pinsapo	Spanish fir
	Acacia melanoxylon	Blackwood
	Alnus glutinosa	Black alder
	Araucaria Bidwilli	Bunya-bunya
	Callitris rhomboidia	Oyster Bay pine
Post-war	Cedrus deodara	Deodar
Post-war	Chamoecyparis thyoides	White cypress
Post-war	Cryptomeria japonica	Japenese Cedar
Post-war	Cupressus arizonica	Arizona cypress
Post-war	Cupressus lawsoniana	Lawson cypress
	Cupressus macrocarpa	Monterey cypress
	Eucalyptus globulus	Blue gum

# Gaughwin—Species trials and arboreta

Plots	Scientific name	Common name		
Post-war	Eucalyptus nitens	Shining gum		
	Eucalyptus regnans	Stringy bark		
	Eucalyptus salicifolia	Black peppermint		
	Fagus sylvatica	European Beech		
	Fraxinus americanas	White ash		
	Juniperous littoralis	Creeping juniper		
	(procumbens)			
Post-war	Juniperous virginiana	Pencil cedar		
	Larix Europa	Common larch		
Post-war	Larix leptolepis	Japanese larch		
Post-war	Libocedrus decurrens	Incense cedar		
	Picea abies	Norway spruce		
	Picea excelis	Common spruce		
Post-war	Picea mariana	Black spruce		
Post-war	Picea pungens	Blue spruce		
	Picea sitchensis	Sitka spruce		
	Pinus contorta	Beach pine		
	Pinus excelsa	Macedonian pine		
	Pinus flexilis	Limber pine		
	Pinus halepensis	Aleppo pine		
Post-war	Pinus lambertiana	Sugar pine		
Post-war	Pinus laricio	Corsican pine		
	Pinus monticola	Western white pine		
Post-war	Pinus muricata	Bishops pine		
	Pinus patula	Japanese red pine		
Post-war	Pinus pinaster	Maritime pine		
Post-war	Pinus ponderosa	Western yellow pine		
Post-war	Pinus radiata (insignis)	Monterey pine		
	Pinus resinosa	Norway pine		
Post-war	Pinus strobus	Weymouth pine		
	Pinus sylvestris	Scots pine		
	Pinus thunbergii	Black pine		
	Populus nigra (?)	Black Italian poplar		
Post-war	Pseudotsuga douglasii	Douglas fir		
Post-war	Sequoia giganteum	The big tree		
Post-war	Sequoia sempervivens	Redwood		
//	Taxodium distichum	Deciduous cypress		
Post-war	Taxus baccata	Common yew		
Post-war	Thuja plicata	Western red cedar		



### Introduction

Until the 1990s, there had been few assessments of the aesthetic value of land-scapes that provided any substantial direction for conservation planning. The Australian Heritage Commission had attempted to grapple with this difficult field but few, if any places, had been entered in the Register of the National Estate for aesthetic value alone. In 1993, when the Commission commenced regional forest assessments of East Gippsland and the Central Highlands in Victoria, the need to develop a suitable method for assessing aesthetic value across regional landscapes became critical. The assessments were to be part of the Regional Forest Agreement process, which integrated an array of scientific, economic, social impact and cultural heritage values into a holistic yet complex program of forest assessments. Embedded in the formal structure of the assessment process, were community emotional and spiritual attachment values—also known as 'sense of place'. Aesthetic value assessments of forests have now been undertaken in Victoria, Tasmania, New South Wales, Queensland and Western Australia. The method that staff applied was developed from previous landscape assessment methods.

This paper first briefly traces the history of aesthetic value assessment methods in Australia and the genesis of the method used in Regional Forest Agreement studies. Second, it evaluates the method and considers how the outcomes meet community concepts of aesthetic value. Last, it discusses some differences and issues which have arisen in the application of the method.

# Development of aesthetic landscape assessment

During the 1960s, conflicting opinions on what is the aesthetic value of landscapes had been brought to public attention as the pressures of development on valued landscapes accelerated. Developments in methods were linked mostly to various new planning and environment legislation. Planners such as Ian McHarg (1967) incorporated landscape quality into suitability mapping, giving aesthetic value professional recognition. But it was Robert Litton, working for the US Forest Service, who in 1968 first provided assessors with a basis for landscape quality assessment, albeit a formalist, visual one (Litton 1968). These works were enthusiastically accepted and followed by landscape planners such as geographers and foresters.

By the 1970s the formal assessment of aesthetic value, usually described as landscape quality, had become a component of most environmental studies. The Australian Heritage Commission was coming to grips with its new legislation, the Australian Heritage Commission Act 1975, which required the assessment of places for the Register of the National Estate. Scientific values were assessed by well-established procedures, while historic values were considered in the light of typologies and thematic context, but the community based social and aesthetic value assessments were challenging and tended to be avoided.

In 1979 the Commission undertook a study of aesthetic value assessment methods of landscapes (Fabos and Macgregor 1979). The study proposed a formal assessment approach and, in keeping with the expert assessments of the time, recommended a landscape character framework for a comparative analysis of visual features. This was a daunting task for the Commission to undertake across the continent and one that was never carried out. This may have been due to an article by J.M. Powell who wrote critically about expert analyses of landscape quality, dismissing landscape evaluation surveys as a planning tool employing selective arbitrary criteria to produce mappable areas (Powell 1979). He identified the dilemmas that successful ventures in evaluation are 'so place and expert-specific that they have no broader utility'. He was critical of organisations such as the National Trusts and the Australian Heritage Commission for reflecting 'narrow interests and aspirations of middle class groups and expert consultants'. He promoted the development of an awareness of place so that communities 'can learn ways of seeing more in the landscapes around them and how to take spiritual possession of them thereby'.

The search for and infatuation with objective scientific approaches in the 1960s and 1970s skewed the theoretical context of the methods. Although geographers and planners had developed much of the aesthetic value assessment methods, the scope of the professions and disciplines engaged in studying aesthetic landscape values was broad. For example Zube et al. (1982) analysed landscape assessment studies from the disciplines of forestry, geography, landscape architecture, psychology, environmental studies and recreation. Formal method approaches using experts were favoured, as they were able to provide the zoning maps needed by planners. Landscape preference models were also popular using ratings of

photographic images of landscapes given by selected groups of people. The ratings determined the popularity of a landscape type or landscape elements. Theorists classified the various landscape quality assessments into paradigms: the ecological, the formal (expert), psychophysical, cognitive (psychological), and phenomenological (experiential) (Daniel and Vining 1983). However the popular approaches began to be challenged by philosophers, social scientists and fine art experts who did not necessarily have an interest in landscape management but felt strongly that 'aesthetics' was their demesne.

A detailed argument against the landscape preference models based on using photographs was presented by the art critic, Alan Carlson (1977). Carlson declared that the predictive psychophysical models had serious limitations and suggested instead a holistic assessment approach using environmental critics. Environmental critics were to be people expert in both landscape systems and aesthetics. The 1980s was a decade of continual debate about the worth of, and scepticism towards the various approaches particularly between the American experts, Carlson and Robert Ribe (1982, 1986). Many methods were reviewed and their reliability, validity and utility analysed. There was great interest and a flood of publications devoted to landscape quality, visual assessment, visual management, and aesthetic values, using a variety of approaches. It was stated in 1993, that 'between 300 to 400 have probably been undertaken, particularly in the United States and Canada with fewer in Britain and Australia' (Lothian 1993: 47).

The Australian Heritage Commission was rather quiet about aesthetic value assessments during the 1980s. It had received many nominations of aesthetic landscapes from National Trust organisations which were proving difficult to assess against the aesthetics criterion. But towards the close of the 1980s the Commission began to be interested in cultural landscapes and social values which were of greater interest overseas probably due to the work of social scientists and historians such as D.W. Meinig, K. Craik and Yi-Fu Tuan (1979, 1986, 1977 respectively). These works encouraged the documentation of feelings and experiences of individuals and groups about places important to them. The Commission at that time was also involved in developing an understanding of Aboriginal landscapes and Indigenous attachment to place. In these cases the complex meanings associated with cultural background, religion, and land well-being are intermeshed with concepts of aesthetic value.

The experiential approach to landscape assessment had been gaining acceptability and in 1982 a publication, Environmental Aesthetics Essays in Interpretation, Carlson and Sadler (1982) presented a selection of essays devoted to understanding that approach. The experiential approach was alluded to by Stephen Bourassa (Bourassa 1991). When discussing the ambiguous nature of aesthetics, he notes that it is 'essentially a realm of symbolism...concerned with the ways we respond to things based on the meanings symbolised in their forms'. The British geographer, Peter Newby (1978) noted 'interest is affected by experience and that it is experience that allows us to attribute meanings'. He compares the experience of nature with 'symbolism' arguing that the environment should be

seen as a stimulus for experience and that symbolism and experience therefore, were key factors in the meaning of 'aesthetic'. This thinking was more in keeping with the Commission's aesthetic criterion, described in the Australian Heritage Commission Act 1994 as 'its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group'.

In an attempt to deal with the nominations and their approach based on visual qualities, an in-house discussion paper prepared at the Commission (O'Brien and Ramsay 1992) attempted to direct a more experiential approach to assessments. The discussion paper was never refined for publication, but it did provide a useful definition for aesthetic value, which became the keystone for the regional aesthetic value assessments when they commenced in 1993.

It was clearly the experiential assessment approach that best suited the requirements of the Australian Heritage Commission's aesthetic's criterion. However only a few documented reports had attempted to apply such an approach to achieve planning outcomes. One of these was an inclusion of evocative land-scape aspects in a multi-strand terrain analysis conducted by scientists R. Arnott and K. Grant (1981). Another was the aesthetic evaluation of Kakadu National Park (Harding et al. 1987) which used a combination of the Arnott and Grant approach and environmental critics, for the assessment.

# Designing a new method

When the regional assessment process commenced in Victoria, expert studies of the landscape quality had already been carried out by the Land Conservation Council and the National Trust. The most comprehensive work covering forest landscapes was the Visual Management System. It had been developed and applied to the state forest areas during the previous decade. The system, based on an expert approach which is a composite of scenic quality, public sensitivity and distance sensitivity, was useful for forest management as it produced mapped zones. But it was not equivalent to the assessment of aesthetic value against the Australian Heritage Commission criteria. The challenge in designing a new method was to achieve interpretation of community aesthetic experiences for defined spatial areas with substantiated assessments.

A first step was to establish a clear definition for aesthetic value. The definition developed by the Australian Heritage Commission (O'Brien and Ramsay 1992) was refined by experts at a peer review workshop as follows:

Aesthetic value is the response derived from the experience of the environment or of particular natural and cultural attributes within it. This response can be either to visual or non-visual elements and can embrace emotional response, sense of place, sound, smell and any other factors having a strong impact on human thoughts, feelings and attitude (Paraskevopoulos 1993: 81).

To satisfy the national estate criterion fully, this value needed to be identified by a 'community' or a 'cultural group'. 'Community' was interpreted as 'people who share common ground', with 'common ground' meaning not just property but

other interests. Characteristics of the value sought in the assessments were meanings, evocative qualites, symbolic values, symbolic landmarks, outstanding landforms or features and compositional qualities of specific landscapes.

The method needed to seek identification of a spectrum of aesthetic values, which were appreciated by community groups or by those who shared a common ground with the region being studied. It needed to embrace different approaches or information sources. At the peer review workshop, Richard Lamb (1993), advocated an eclectic approach to aesthetic landscape assessments, stating that aesthetics is a complex idea and an even more complex experience and 'that the method should be like the aesthetic experience itself: innate, cultural, multifaceted, multi-channel, consensual, individual, commonplace, elite, concrete and abstract. Oh, and simultaneous'. At the time that statement was made, an eclectic approach was already underway.

#### Method

The method adopted is a multi-layered approach combining information obtained in workshops from different sources such as local communities, recreation and major stakeholder groups, and forest critics (also obtained through interviews). To corroborate the community information, other sources of aesthetic place appreciation were recorded from the well-known art and literature, tourism data, and other reports which included the Visual Management System maps (where they were available). Expert field assessments of selected places were required to validate the extent of the expression of the value.

The method described in what follows has been applied to all the Victorian, New South Wales, Tasmanian and the South-West Western Australian studies for the Regional Forest Agreements. Through the continuing work with different Agreement assessment projects, the method has been refined and improved from its initial application in the 1993 studies.

### Community workshops

Within regional locations, workshops were held at selected centres of community catchments. Representatives of all the community social organisations, industry, recreation and other forest user groups were invited. To ensure the extent of the region was covered as much as possible, individuals familiar with the more remote areas were invited. In order to obtain information from representatives of the peak recreational organisations and other stakeholder groups who regularly use the region, one workshop was held in the State capital.

The topic of the workshops was kept to a general level designed to understand the spectrum of heritage within which aesthetic value was included. Initially participants were asked to identify what they understood heritage to mean and hence themes of heritage importance were established. Within those themes aesthetic value was clearly present and interwoven amongst the understanding community members held for heritage value. Words used by community members containing an 'aesthetic value' meaning were 'beauty', 'important', 'unique',

'recreational', 'nature', 'enjoyment' 'original', 'inspirational', 'unusual perception', 'ancient', 'pride', and 'scenic'.

The workshops were planned to inspire, encourage and elicit information, and critical to their success was sensitive and skilled facilitation. Participants firstly went through a listing exercise and then each undertook a selection of the top ten places from the combined lists. Participants were also required to record places that they initially identified, and describe their values. All places recorded were delineated on topographic maps by the workshop team. Examples of places people identified as possibly having aesthetic importance were rivers and streams, travel routes, rainforests, ecological communities, geological formations, rock formations, viewing points, sacred sites, beauty spots, walking tracks, waterfalls, pristine habitats, pristine catchments, old trees, unusually formed trees, mountain ranges, mountain ridges, mountain silhouettes, and bridge settings.

#### **Forest critics**

The term 'forest critic' was derived from the writings of Alan Carlson (1977) who suggested that experts on landscapes capable of making critical assessments would be environmental field officers with knowledge of aesthetics who could be called environmental critics. The method proposed that with regard to forests, such experts would be individuals from the management authority who had ground knowledge of their local forest district, an understanding of landscape processes and a sensibility that allowed them to see places in an objective way. Although recognising that they have no formal training in aesthetics, managers are trained to be observant and have extensive experience with landscapes. Care was taken to ensure that information came from a range of individuals who collectively could cover the geographic extent of the region.

Forest critics undertook a workshop process of identifying places with the value, mapping the landscapes containing the value, then collectively providing a rating between 1 and 5 on what they felt the value deserved in its regional context.

#### Art and literature

Historical records of art and literature often depict and celebrate places popular for aesthetic quality. Bourassa (1993: 11) discusses how perceptual and design strategies may result in changes in cultural attitudes toward the landscape. He noted that 'innovative individuals will transmit their perceptual strategies to others using prose, poetry, painting or some other means of communication'. Such enhancement of places and types of places through imagery is manifest also in tourism and conservation promotion.

As part of the multi-layered method, the well known works of art and literature that have contributed to the aesthetic identification of places in the regions were considered and evaluated for their importance in denoting places of aesthetic value to past and contemporary generations. For example, the Victorian forests had provided subject matter for artists such as; Eugene von Guérard, Nicholas Chevalier, Louis Buvelot and others who painted popular land marks, landform phenomena, and captured the colours, light and form of the rainforests with ferny

understorey. While around the turn of the century, Nicholas Caire exposed the public to textured images of forests through black and white photography.

The influence of romantic images of ferny forests, and iconographic landform features that captivated nineteenth century Australia may to some degree still infatuate people, but it appears that fashion in art media and its influence has changed. In Victoria, wilderness photography and media images of naturalness, forest textures, forest details and wild waters are the imagery that is best appreciated by the population of the 1990s being displayed on posters, cards, calendars, and film. However forests still considerably influence contemporary artists, poets and writers. This was noted in the Queensland aesthetic value study by Lennon and Townsley (1998) which highlighted examples of Judith Wright, Janette Turner Hospital, Conrad Martens, Lloyd Rees and Arthur Boyd (see Chapter 25). The study also mentioned that the threat of loss of integrity of forests has fuelled keener interest in places and the visual imagery of forests. It noted that 'there is an increasing desire of young artists to cite the specificity of a place in their works, an indication of a renewed sense of connection to the landscape and forest in this region' (Lennon and Townsley 1998: 7). Ratings for the works were determined by factors such as public recognition of the work or the artists and their association with the places. The continuity of aesthetic response to particular places was noted in the Queensland and also in the Victorian research where different artists at different times have painted features such as Strath Falls and Hanging Rock.

This connection to place is strongly evident in contemporary Aboriginal art as demonstrated by the 'Art of Place' exhibitions, conducted by the Australian Heritage Commission.

#### **Tourism**

The 1993 study also identified popularised 'beauty spots' from published works about the area such as tourism books as well as brochures, and tourist maps. Appearing in the brochures are places that are local identity markers. Williams and Stewart (1998) discussed how 'the social, technological, and economic forces of globalisation have weakened local distinctiveness.' But it appears that now communities claim a local landmark feature to enhance their identity or to anchor themselves to the landscape. Local identity markers are often features such as a nearby lighthouse, waterfall or a distinctive hill. Such identity markers are commonly found on council logos and in folk art, as well as tourist products such as tea towels, spoons, and other articles. Most of these places identified in the community workshops embody a local visual identity and are also the places most frequently visited by tourists.

It became apparent in applying the method in 1997, that the tourism industry is not original in the information it provides. As well, the landscape images it uses for advertising tend to be frequently reused for promotion of different commercial enterprises.

Well known places identified from tourism sources were recorded. The indicators used for rating the tourism publications on forest places varied in the different studies. In the Western Australian study a frequency analysis of tourist

literature was conducted and a set of measures (known as a rule set) applied (ERM Mitchell McCotter 1998). In Victoria the rule set was based on the level of exposure of the published source to the community and the frequency of the depiction.

## Other professional studies

As previously noted, visual quality assessments had been carried out within the forest study regions by authorities such as the Victorian Land Conservation Council, National Trust and the State Forest authorities. The most extensive of these studies was the Visual Management System. These were reviewed and information relating to places within the study area having high visual quality was recorded.

## Assessment of data using thresholds

All the information identified and evaluated as having aesthetic importance from various sources, was assembled and when it related to the same place, the data were combined to develop a record of aesthetic appreciation of a particular place. Measures to assist in the final assessment against the criteria are known as 'thresholds'. The thresholds needed to be explicit so that reasons for value identification could be clearly substantiated. As well, thresholds ensured that the assessments were not merely a measurement of relative popularity but of the strength of the value. Thresholds were set by the Commonwealth and State agency for each region. Assessment against the thresholds was the final step in the process.

Places with an aesthetic value which were above the threshold and were mapped, were determined to have indicative national estate value. For example the aesthetic significance of Mount Buffalo National Park was determined by recordings from ten community and forest critics workshops, numerous tourism publications and posters, works of art including well known paintings by Chevalier and Streeton, and National Trust records. Another but less well known place in the same region, Snowy Creek and Clearings, was also deemed to be of aesthetic significance due to recording at two community workshops and one forest critics workshop.

Detailed descriptions of the assessments are available in reports prepared for the various Regional Forest Agreement studies (Robin Crocker 1997; Lennon and Townley 1998; ERM Mitchell McCotter 1998).

# Evaluation of the method

An evaluation was undertaken in order to consider the validity, reliability and usefulness of the method for identifying and assessing the aesthetic value of large landscape areas. The evaluation used a questionnaire survey as well as the results of the various regional assessment studies.

The questionnaire was designed to test validity of the experiential approach and a useful model for the questions came from the perception study by Lamb and Morris (1997) on the aesthetic appreciation of old-growth forests. Questionnaires were distributed to rural community members who live near forest areas, bureaucrats working on forest projects, and tertiary students familiar with forest environments. A total of 138 questionnaires were distributed and 44 were completed.

A series of questions were designed to find out: (i) if aesthetic value is important in people's perceptions of forests; (ii) if experience is the basis for aesthetic appreciation of forests rather than beliefs about forests; (iii) if there is a difference in the strength of aesthetic appreciation based on experience rather than beliefs; (iv) if a beliefs based aesthetic appreciation can be applied to any forest rather than a specific place; (v) if the aesthetic experience is predominantly related to an experience of the senses, to visual quality or to some other aspect such as spiritual, symbolic or inspirational value; (vi) what physical features enhance the aesthetic experience; and (vii) how the visual experience of the forest from a distance compares with the experience of being within the forest. Questions provided a selection of choices for answers and as well, space for comments or other answers. Some of the answers to the questions provided enriching information on the spectrum of meaning of aesthetic value (Table 1).

## Is the method valid?

The results of the questionnaire indicated that respondents valued aesthetic qualities of forest landscapes well above other values such as biodiversity. Of the 44 responses, 75 per cent were for aesthetic reasons or mixed aesthetic and natural values, 20 per cent of responses were clearly only related to appreciation of the natural qualities such as flora and fauna, one was to using products (whatever they might be) and one was because of personal memories. The most common aesthetic quality noted by respondents was 'peace' and 'peacefulness'. Other commonly used terms were 'being at one with nature', and 'inspiring' and inspirational'.

The strongest source of appreciation and inspiration for aesthetic value of forests were recorded as 'being in forests' by 68 per cent of respondents. Whereas 6.8 per cent were inspired by art, and 4.5 per cent were equally influenced by literature, wildlife or wilderness photography, or 'seeing forests from a distance' while 11 per cent did not respond. From the answers to the questionnaire, it is reasonable to suggest that the experiential approach based assessment, developed and undertaken in the Regional Forest Agreement process is a useful tool in identifying significant landscapes. However the questionnaire has pointed out that the definition for aesthetic value used in the studies requires some refinement.

## Is the method reliable?

The method is clearly recorded, but no repeat application of the method to any region has been undertaken. In a community assessment it is doubtful if identical results would be achieved unless exactly the same people were involved. Furthermore another point that could be raised regarding the employment of the method is whether or not the community research adequately captured a full range of opinions.

Table 1: Examples of selected questionnaire responses

Question: If you like forests, what is special about forests to you?

#### Local Community:

- Diversity, awe inspiring, untamed, link to natural environment
- The balanced ecology, before white man started to destroy this wonderful land
- Flora and fauna, colours, tones, smells, timelessness, naturalness
- Beautiful, senses of pleasure, harmony, enjoyment, scale and time
- Detailed ecological relationships and evolution, bird habitat.

#### Forest Officers:

- Place to escape, to enjoy serenity and appreciate natural values
- Being inside a thriving ecosystem, being surrounded by plants and animals in a natural environment, peace and tranquillity, reflection
- Peaceful environment, smell of timber, beauty of single trees
- Being able to observe nature and natural history
- Sense of the environment in which some Aboriginal groups lived before European settlement

#### Students:

- Quiet, relaxing, peaceful, therapeutic and refreshing in a stressful world, out of suburbia, less evidence of humans changing environment, the 'wilderness' aspects
- Ancient presence of trees and plants, large trees, wind sounds, bird-life, solitude, aesthetics, lush feeling of a rainforest, smell
- Place for walking and sightseeing, simply their beauty, natural, away from rush, inspirational, imagine it is full of fairies, gnomes, fantasy
- Important parts of the landscape, to go there to use products, to see in the distance
- It soothes my soul

The reliability of the method is also relevant to the financial resources available for the study. Adequate funds must be made available to undertake a sufficient number of community workshops throughout the region. It was also noted that in the Queensland study (Lennon and Townley 1998) there were less corroborative sources of information than in Victoria. Further investigation would be needed to adequately test the reliability of the method.

#### Is the method useful?

The results from the application of the method are mapped areas of substantial aesthetic significance. This information provides data for making decisions on landuse and protection of places. It also provides a data record for places that could be expanded in the future if required. The places identified as having aesthetic value significance will be considered for entry in the National Estate. The method is therefore useful for landuse planning and conservation management.

# Discussion of issues relating to the method

A number of issues have been raised by assessors and others, concerning the method and its application. Place delineation from the various sources is usually not of a high standard. In recent aesthetic assessments there has been a tendency for individuals to attribute aesthetic value to very large areas such as the entire Alpine National Park or a type of place such as all the red gum forests in the region. Professional work is therefore required to tease out a defined area for which the value applies. The data may not be graded relative to thresholds. Although this is the convention in heritage assessments, land management authorities may regard it as being not as useful as having a high, medium or low grading.

In keeping with other regional assessments, it has been argued that there is a need to evaluate the assessments regionally. This is difficult to do with community values but it must be noted that at all the workshops a collective rating of places is undertaken and the regional context is considered in the setting of thresholds for each region.

The method relies on places being comparatively popular while little known places are not well supported. Some say this is not a true measure of aesthetic heritage value. This may be so, but the method clearly follows the direction of the Australian Heritage Commission criterion used for the assessment. The assessment method must also always be considered within its context in a Regional Forest Agreement process which includes an array of environment and heritage assessments. Many landscapes are protected as a result of those assessments and those landscapes may in the future acquire a community-based aesthetic appreciation.

Facilitators have to take on trust what individuals in workshops state and they need to be aware that there is scope for groups with particular motives to inflate the results.

Although the method is similar for all the States, the assessments are unevenly funded, and the data resources vary. There is usually consistency within a State but not necessarily across the nation. This means that the aesthetic value assessments in Victoria cannot be compared with those in Queensland with a low population density and fewer data resources, or with those in New South Wales which had less funding for aesthetic value assessments.

Conserving an array of the best examples of different landscape types of high visual quality is a process that experts have proposed in the past (Daniel and Vining 1983: 76). This paper argues that such an assessment is not of the aesthetic importance valued by the community, although it may, in time lead to such places being declared of aesthetic value importance. Conserving best examples has no link to human experience or human attachment to a particular place. It also does not recognise places such as a mountain, which may not be visually remarkable but are important to a community that use it regularly for their aesthetic experiences.

## Conclusion

The results of the evaluation suggest that the multi-layered aesthetic value assessment approach is fundamentally sound. The experiential approach to aesthetic value assessment is valid and useful but its reliability has not been fully explored. The method was particularly practical in its application to extensive landscape areas.

In the Regional Forest Assessment environment and in heritage assessments, aesthetic, social and Aboriginal heritage are the only assessments which directly engage people in contemporary identification of their heritage. During the course of the studies community members became aware that the workshops were a venue where they could have their say about heritage matters important to them. Since the 1993 studies, the number of workshops held in Victoria was doubled and participation expanded from the average of approximately 15 individuals in East Gippsland to an average of 30 in the West Victoria region.

The aesthetic value assessments are available as consultant's reports or are available as summaries in the National Estate Reports, prepared for each region. This means that there will be a large pool of data covering the twelve regional studies available for further research.

A significant result of the aesthetic assessments is that they tell us that the spiritual and symbolic value of forests to people is considerable. This is not surprising, and has been noted by theorists for at least a decade. Some theorists have singled out aesthetic value as being distinct from spiritual values, symbolic values and abstract values (Lamb and Morris 1997). But as far as the Regional Forest Agreement studies are concerned, symbolic, spiritual and abstract values are all encompassed by aesthetic value.

The results of the questionnaire and the assessments suggested that the experiential, symbolic and spiritual meanings are the strongest aspects of aesthetic value and that they are generally indivisible. In light of these findings this paper recommends that the Australian Heritage Commission adjust its working definition of aesthetic value to include spiritual and symbolic values as follows:

Aesthetic value is the response derived from the experience of the environment or of particular natural and cultural attributes within it. This response can be either to visual or non-visual elements and can embrace emotional response, sense of place, spiritual or symbolic meanings, sound, smell and any other factors having a strong impact on human thoughts, feelings and attitudes.

Aesthetic value is about experience—the interaction of a human with a place. It also needs a medium to describe the aesthetic experience. For most people describing an aesthetic experience is not easy. Where aesthetic value of the forests has been described in the assessments and questionnaires, it was often original, emotional and occasionally lyrical. The title of this paper 'it soothes my soul' came from a questionnaire response, and a similar description, 'it runs off on my soul' came from an East Gippsland resident in the final line of a poem written for

the Dawson Range. The Dawson Range in East Gippsland is now in a reserve for aesthetic and landscape values.

The Regional Forest Agreement studies have taken a gigantic step towards achieving people's aesthetic value assessments of the Australian forests. The assessment model demonstrates that aesthetic value can be assessed in a structured fashion. Aesthetic value is an important and powerful value, that cannot be ignored.

# Acknowledgement

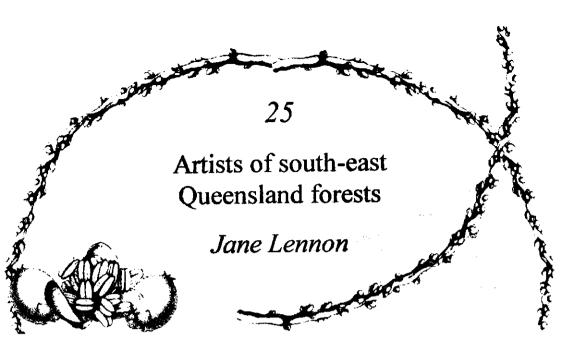
The author thanks Environment Australia for allowing her to present the paper at the Forest History Conference 1999. While much of the information relates to the work undertaken by Environment Australia, the evaluation was carried out by the author as a private research project.

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When first I knew this forest its flowers were strange.
Their different forms and faces changed with the seasons' change—the thick-fleshed Murray-lily, flame tree's bright blood, and where the creek runs shallow, the cunjevoi's green hood...

Now that its vines and flowers are named and known, like long-fulfilled desires those first strange joys are gone.

My search is further.
There's still to name and know beyond the flowers I gather that one that does not wither—the truth from which they grow.

(from The Forest, by Judith Wright)

# **Background**

A study of places of aesthetic value was undertaken as part of the Comprehensive Regional Assessment of forests in south-east Queensland. This paper considers the aesthetic values of forest places based on studies of artistic endeavour and on regional community workshops which were held to identify and assess the aesthetic values of the forests of the South East Queensland biogeographic region. Sub-consultancy studies covered literature and music, visual arts and film, historical photography and tourism images, and a number of regional community workshops were held. The results of the sub-consultancies were combined into a central database which, with the results of the community workshops, were analysed to assess and determine threshold values for forest places of potential National Estate significance.

# Study area

The region covers 6.2 million hectares from the New South Wales border to Gladstone and west to Toowoomba. It is an area of great biological and physical diversity. Its physical geography ranges from extensive alluvial valleys and coastal sand masses to volcanic hills and rugged ranges, all of which support a wide range of forest types and inspire a range of aesthetic responses. The area contains World Heritage areas such as Lamington National Park and Fraser Island. About 50 per cent of the vegetation cover of the region has, however, been cleared for urbanisation, agriculture and grazing. Some of the ecosystems most affected by clearing include lowland rainforest that fringed many streams, forest redgum woodlands of the alluvial plains and tall paperbark forests that grew near the estuaries of coastal streams. Compared to the lowland parts of the region, the forested hills and ranges retain a high proportion of their natural vegetation cover. Analysis of the survey results indicates that places of aesthetic value are on the whole concentrated in these forested hills and ranges and that the integrity and continuity of aesthetic value in this region has been circumscribed by the history of land use.

## **Definitions**

The working definition of aesthetic value that underpinned this project was that put forward at the workshops conducted by the Australian Heritage Commission in 1993:

Aesthetic value is the response derived from the experience of the environment or of particular cultural and natural attributes within it. This response can be either to the visual or to non-visual elements and can embrace emotional response, sense of place, sound, smell and any other factor having a strong impact on human thought, feelings and attitudes (Paraskevopoulos 1993:79).

National Estate Criterion E was used in combination with this definition:

- E The importance of a place 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.

Subcriteria under E.1 include significance and threshold Indicators which were taken into account (Table 1). The definitions and criteria were the basis upon which thresholds were set as they encompass both popular and high art notions of aesthetic value. The survey of tourism images and the regional community workshops provide the clearest and most direct indication of community perceptions of aesthetic value.

One of the major issues is the idea that aesthetic perceptions and values projected onto the landscape are subjective and in some sense therefore unmeasurable. This is seen as contrary to the way, for instance, that species might

## Understanding

be able to be counted and classified to indicate an aspect of a region's biodiversity. A working definition of aesthetic value can be agreed upon but the absence of consensus about a framework for how best to measure aesthetic value is evidence of the fact that aesthetic value is considered to be somewhat elusive, or to reside in the eye of the beholder. The classical distinction between objective and subjective reality relegates the aesthetic (the emotional, the sensory, the experiential) to a less precise and unmeasurable realm. It would seem that amongst other values, aesthetic value suffers because of the way the debate is structured, not because it is any less measurable than other values in the land-scape. The issue came into focus in setting thresholds in the Comprehensive Regional Assessment process. A combination of quantitative and qualitative indicators of significance was used. Much more theoretical work is required before aesthetic value is generally considered to be as significant as other values for the management of forest areas. Some consensus on measurement is needed.

Table 1: Subcriteria under National Estate Criterion E.1

Significance indicators	Threshold indicators
Meanings, evocative qualities, symbolic values (inspirational, awe inspiring, majestic, untouched, pristine, fearful; having age/time depth, naturalness, lushness, peace, tranquility, mystery, etc.)	Cultural features or landscapes and natural features or landscapes with evocative qualities, symbolic or other associated meaning, recognised and regarded as outstanding by community groups
Symbolic landmark (represented in art, poetry, photography, literature, folk art, local identity imagery, folklore, mythology etc.)	Important local landmark valued by a community or cultural group
Outstanding landform or feature (dramatic, sublime, unusual shape, strong colour etc.)	An unusual or prominent landform or feature which has distinct form, is prominent in the local area, or has symbolic importance
Attributes and composition qualities (colour, form, texture, detail, movement, unity, animals, sounds, spatial definition, prospect etc.)	When compared with other like places or landscapes of similar character or characteristics the strength of the aesthetic attributes is high

# Method

A comprehensive, though certainly not exhaustive, list of artists, writers, poets, musicians and filmmakers and their works associated with the region's forested areas was compiled. This database was sorted by place and locality to determine references to aesthetic value. A total of 163 places within the biogeographic region were identified in the database and of these 55 places were assessed as

over the threshold set for determining National Estate aesthetic value. Common points were raised by all the sub-consultants.

The absence of outline texts and existing scholarship in landscape depiction history in Queensland meant that the relevant material had to be compiled from original sources and first principles. Much information remains to be uncovered. It was often impossible to obtain access to works of art, particularly to visual art works, which were needed to describe particular views. This affected the mapping of specific places and the description of views. It also made it hard to consider the continuity of aesthetic integrity of a place, i.e. whether it was largely intact since depiction. It was not possible to comment on the standing of particular art works (i.e. whether internationally or nationally acclaimed) nor on the time an artist spent in a particular region. Such comments would have required detailed analysis of secondary source material such as critical reviews, and research into biographical details of artists' lives, which was not possible in the time. This affected the application of some of the Indicators of Significance.

Many references or citations of forested places were generic in nature and it was often impossible to determine particular localities to which they applied. Abstract or conceptually based works are by their nature impossible to map. This affected the mapping of specific locations and led to citations being grouped and to the mapping of regions with pockets of aesthetic value. Access to the forests, both historically and now, has affected the popularity of places across artistic genres. Indeed it is clear that depictions of some forested places appear noticeably more often once access became easier as it did, for example, following construction of new roads to Lamington National Park and the Bunya Mountains.

Sub-consultants provided very little preliminary analysis of the most popular places depicted by poets compared to musicians. However, in the integration phase, an analysis of the separate data sets shows that popularity of places is consistent across art-forms or, at least, identifiable trends appear which have been confirmed in the integration phase. All data shows a bias towards the south-east of the region with fewer entries for the more northern sections. Early access to these regions together with population density were suggested as reasons for this bias by a number of the sub-consultants.

There is some recurrence of the views depicted across different types of art works, which is partially circumscribed by the geography to access points and lookouts such as the view of the Glasshouse Mountains from Mary Cairneross Park. Another good example is that of depictions of the Bunya Mountains which are often taken from the top of its narrow spine looking out to the plains below, whereas depictions of Lamington in the tourism literature are taken from deep within the rainforest or from mountain to mountain, as referred to by Raymond Curtis in his 1989 orchestral work Journey Among Mountains.

# Music and literature

The changing nature of the forested landscape and the changing nature of perceptions of the aesthetic values of that landscape are dominant themes. Artists have

found aesthetic value in the trees, such as in Judith Wright's *The Cycads* inspired by ancient trees on Tamborine Mountain, as well as in the human occupation and destruction of that landscape such as in Paul Grano's 1940 poem *Walking Samford Way* where he commemorates the work of pioneering settlers who cleared the forest. Understanding the changing nature of the forest and of the values that humans project on it makes the problem of defining aesthetic value increasingly a 'non-problem'. Continuity of aesthetic response to particular places allows one to testify to 'areas of consistent importance within a range of other cultural and physical values (Blair and McKenzie 1998: 18).

In the data collected, poetry emerges as the dominant form of writing about forested places. The lyric appears to be more suited to writing about forest places. A larger proportion of writers cited in the database were women who represent places in both imaginative work and journalistic or non-fiction pieces.

Prose fiction, grounded in narrative, is more usually focussed on story and character than on descriptions of places. Thea Astley's novels for example are full of the evocation of human lives in a place rather than centred on the evocation of place as witnessed in Patrick White's Eye of the Storm (Blair and McKenzie 1998: 21). Writing for children in Australia has a long history of connection to place. Jill Morris's work is an important inclusion in this genre. This author lives and works in Maleny in the Blackall Ranges and is a passionate advocate of the environment in her beautifully illustrated, non-fiction children's books. Other collaborative works between artists, writers, photographers and musicians are included in the database such as Stephen Leek's musical compositions that include pieces of writing by the poet Thomas Shapcott (Blair and McKenzie 1998: 22).

Many references to forest places in artistic works encountered were of a non-specific nature. With few exceptions writers have tended not to write about specific places, obscuring evidence of connection to places such as in David Malouf's Harland's Half Acre which is almost certainly based on the hermit painter, Ian Fairweather's life on Bribie Island. Other expatriate authors such as Janette Turner Hospital are unusual in making specific reference to place and give detailed description of Cedar Creek at Samford and of areas on Tamborine Mountain (Blair and McKenzie 1998: 22).

The desire to not name places may suggest an ambivalence to citing place or more likely to seek a more universal significance by not grounding the characters and the narrative to a place. However, there has been a significant change in attitude to the citing of place and recognisable places are appearing in more recent work such as that of Raymond Curtis and Janette Turner Hospital.

Blair and McKenzie state that the accelerated awakening to a sense of loss of integrity of many forested places has fuelled keener awareness of the particularity of place (1998: 24). The shift from a confident belief in the unlimited resources that forests provided to a concern for conservation and care of forest areas was noted. Authors such as Judith Wright becoming active participants in the Australian conservation movement are clear indicators of this change in attitude, as is the work of Jill Morris living and working in Maleny in the Blackall Ranges. This

point is also argued by Glenn Cooke in his essay on visual imagery pertaining to forests, with content of visual art works increasingly (since the 1950s) dealing with floods, bushfires, erosion etc. (Cooke 1998).

In literature and in music the places most written about are the major recreation areas in the south-east including areas already set aside as National Parks or State Forests: Lamington National Park and adjacent areas, Tamborine Mountain, the Noosa-Cooloola area, the Blackall and D'Aguilar Ranges, the Scenic Rim and the islands such as Fraser, Moreton and Stradbroke. This was also reflected in the visual arts, tourism and photography research.

## Visual arts and film

Since the establishment of collecting institutions such as the Queensland Art Gallery in 1895, there has been a shift in artistic practice from a predominantly landscape oriented local scene to the depiction of urban scenes and townscapes in the first part of the twentieth century. From the 1940s onwards the major focus was on a social realism that depicted the decay of the inner suburbs of Brisbane. Later in the 1960s the major focus of artistic interest was abstraction which was oriented away from the literal depiction of actual sites. This fact, combined with the shift in collecting policies from traditional to innovative art, meant that more traditional works were not collected. Landscape art with the notable exceptions of works by Sam Fullbrook, Lawrence Daws and William Robinson has not been considered innovative (Cooke 1998).

The most significant artist of the colonial period who depicted forested areas was Conrad Martens who came to Brisbane and south-east Queensland in 1851-52 to record the properties of the newly wealthy squattocracy and at the same time produced images of forested areas. As Glenn Cooke states, the grand romantic notion of the Australian bush was not realised in Queensland. Artists of the calibre of Nicholas Chevalier, Eugene von Guerard or W.C. Piguenit never painted the local scene. The contemporary works of William Robinson of the Beechmont and Canungra regions are the closest to this vision (Cooke 1998).

Jolly notes the 'European' nature of much of the early depictions of forested areas and landscapes around Brisbane as evidence of a lack of concern with the specific detail of the landscape and of the peculiarly Australian flora (Jolly and Pease 1998). Although it is undoubtedly true that such landscape works were European in vision, artists such as Martens felt strongly about the landscape that they were depicting. In a letter to his brother Henry, in 1851 Martens argued:

the necessity of preserving the character and true delineation of the plants etc., in the landscape of this country is a point which I have ever considered of great consequence (Martens in Steele, 1978: 20).

The optimistic view of the landscape as robust and endlessly bountiful observed in the work of writers, is similarly apparent in many visual images of the late nineteenth century such as F.J. Martin Roberts or P. Stanhope Hobday (Bradbury and Cooke 1988). The visual arts data supports the notion of a shift in

consciousness relating to the landscape, an increasing concern with the fragility of both the landscape and of forested areas in concert with the growth of environmental consciousness.

As was also noted in the literature/music data, the results of the visual arts survey are biased to the south-east section of the region. Only a very few photographers in the pre-1890 era bothered to document forest areas. They relied upon consumers for their living, and most demand was for portraiture and scenery detailing colonial progress such as public buildings, bridges, railways, street scenes and townscapes. Where Brisbane and Ipswich photographers bothered to offer picturesque views of creeks and wooded areas, these were locations known to residents or visitors and, in the majority of cases, have long since disappeared. With the advent of amateur photography and associated Camera Clubs in the 1890s more attention was paid to nature photography but again access to locations determined what was photographed. Only an intrepid few such as C.E.S. Fryer took his equipment off the beaten track and climbed the heights of the Glasshouse Mountains in 1894 (Longhurst 1998).

One of the notable absences in the visual arts data, as well as in the database as a whole, is the lack of citations of Indigenous works relating to the forests of south-east Queensland. The work of contemporary Indigenous visual artists such as Vincent Serico and Ron Hurley who live and work in the region require further research.

## Tourism literature

Depictions of forests across the tourism publications surveyed are invariably beautiful, very scenic and taken from well-known lookouts across valleys and farming land, or are of falls at sunset or of forests in different seasons. In general, forests seem to be cited or depicted in tourism literature as central attractions in the region, although the captions under photographs are often non-specific, referring to large places such as Fraser Island or Lamington National Park. This is echoed in the way artists often refer to place. The Queensland Department of Primary Industries and the Department of Natural Resources tourism/visitor information literature has limited depictions of forests. Often publications from Department of Primary Industries do not list specific places but general areas. Department of Natural Resources posters are of types of forests as opposed to those of the Department of Environment where specific forest places are noted.

Publications of the Queensland Tourism and Travel Corporation and their local affiliated Regional Tourism Associations are important sources for the circulation of visual images and information about the forests of south-east Queensland. Because consistency is essential to the success of tourism, the Queensland Travel and Tourism Corporation, as the peak Government tourism agency, has a monopoly on tourism literature and thus on images of forests within it. They do not employ historical photographs or other aesthetic references to promote particular places.

In general, the more professional the brochure the more generic the depiction of forest areas. Some of the smaller, more local and amateur publications provide a clear indication of social and aesthetic significance of forest places.

Two hundred and sixty-two pictures of forest regions were entered into the database and 90 different places/localities were cited. In the tourism literature surveyed the most-often depicted forest regions were Bunya Mountains, Fraser Island, Glasshouse Mountains and Lamington National Park. Twenty-three forest areas were depicted three or more times. (Table 2). Fraser Island citations constituted 15 per cent of total forest images.

Table 2: Forest areas cited three or more times in the tourism literature

Fraser Island	21	Imbil State Forest	4
Glasshouse Mountains	12	Kroombit Tops	4
Lamington National Park	11	Noosa Headland	4
Brisbane Forest Park	9	Tamborine	4
Bunya Mountains	8	Blackdown Tableland National Park	3
Binna Burra	7	Cania Gorge National Park	3
Moreton Island	7	Crow's Nest Falls National Park	3
D'Aguilar Range	5	Deepwater National Park	3
North Stradbroke Island	5	Kenilworth	3
Springbrook	5	Kondalilla Falls National Park	3
Blackall Range	4	Town of 1770	3
Cooloola	4		

# Regional community workshops

Thirteen regional community workshops were held in Boonah, Brisbane, Bundaberg, Crow's Nest, Dayboro, Gympie, Kingaroy, Maryborough, Miriam Vale, Monto, Murgon, Nambour and Nerang (Forest Assessment Unit 1998). They were attended by invited participants to capture their perceptions about social, historical and aesthetic value. Over 125 individual places of aesthetic value to the participants were listed.

# Integration of data and assessment

The professional land use planners and field staff in Queensland do not have a visual management system to provide a series of mapped zones reflecting assessments of scenic quality, public concern (sensitivity) levels, area views from travel routes and areas used for recreation. East Gippsland's visual management system's high scenic quality zones, were used to corroborate places of aesthetic value identified from other sources such as community heritage workshops, the art literature survey and tourist information. The Victorian studies also had the benefit of a system of landscape character types which were developed, based predominantly on the visual management system zoning. This enabled crosscomparison of places within areas having similar landscape characteristics. All

## Understanding

landscape areas were classified according to these landscape character types so that a better comparative assessment of like places across the region could be made.

## Table 3. Indicators of significance

## A. Frequency of association

The total number of individual artists or authors for the place.

#### B. Number of media

The number of different media occurring in the database used to depict the place.

- C.1 Public recognition of the artist/author depicting the forest place Consideration of the level of public recognition of the artist depicting the forest place.
- C.2 Public recognition of the individual work

The extent of public recognition of individual works depicting the forest place.

C.3 Public recognition of the aesthetic nature of the place

Where there had been community workshop identification of the aesthetic nature of a place mentioned on the database, it was indicated here. Results of the regional community workshops were included in this. The accuracy with which a place could be mapped was also included under this indicator.

D. Artist/author's association with the place

The strength and longevity of one or more notable artists' association with the place.

E. Length of association

The number of years that the public and/or the artistic community have regarded the forest places as important by virtue of its association with the artist or work.

#### F. Intactness

The degree to which the impact of physical change, both natural and cultural, have altered the appearance of the place since being featured in a work.

Given the absence of such studies for south-east Queensland, the system of environmental provinces delineated by Young and Cotterell (1993) was used to provide surrogates for the broad landscape units. These were used to group the places of aesthetic value identified in the sub-consultant studies. The geography of the landscape and typical views suggested larger groupings resulting in the mapping of specific localities within larger geographical areas, such as within the Scenic Rim or the Blackall Range, as well as mapping concentrations of aesthetic value in these larger regions.

The environmental model as a basis of landscape delineation is more inclusive of the wider definition of aesthetic value, as in the Australian Heritage Commission criteria, than the landscape model based on visual assessment of topography.

The latter, incidentally, is the basis of the landscape art genre, and is more restricted to the two dimensional scene—the seen view.

Assessment of forest places of National Estate aesthetic significance followed the methodology developed by Young and Lennon (1996) for the Tasmanian Regional Forest Agreement project. The six indicators of significance are described in Table 3.

The consultants complemented the largely quantitative indicators of significance with another seven qualitative measures which addressed the degree of aesthetic value of a given forest place rather than just the number of citations of forest places. These qualitative measures were borrowed from the Comprehensive Regional Assessment for the East Gippsland Region (Commonwealth of Australia 1996: 27).

Though a place may have met all Indicators of Significance, if it could not be said that the place was intact since depiction—as in the case of Bundaberg Remnant Bushland—then it did not reach the threshold. The ability to map places with aesthetic value from the data together with the degree to which aesthetic integrity could be said to have been maintained from the earliest depictions until the present day, were overriding factors in the threshold process. These were the principles guiding the integration of data to highlight places of aesthetic value.

The question of physical integrity of a place was problematic as there was not a field component to this aesthetics project and works of art were often not accessible as was mentioned earlier. The assessment relied on the experience and knowledge of place of all involved in compiling and integrating the data. Some further indication was provided for places featured in the current tourist literature, as this indicated that sufficient aesthetic integrity remained.

Table 4: Forest places which met the threshold standards

Binna Burra	Currumbin Valley	Mount Perry Ranges
Blackall Range	D'Aguilar Range	Nerang State Forest
Boonah Pastoral	Fraser Island	Noosa Headland
Landscape	Glasshouse Mountains	North Stradbroke Island
Bribie Island	Imbil Forests	Original Maryborough Site
Brisbane Bushland	Jimna Forests	Peregian
Brisbane Forest Park	Kondalilla Falls N.P.	Ravensbourne N.P.
BrisbaneValley Pastoral	Kroombit Tops	Samford Valley
Landscape	Lamington N.P.	Scenic Rim
Buderim Mountain	Many Peaks Range	Springbrook Plateau
Bunya Mountains	Maroochy Remnant	Tamborine Mountain
Burleigh Heads	Bushland	Town of 1770
Caloundra	Moogerah Peaks	Upper Coomera Valley
Cania Gorge	Moreton Island	Upper Mary Valley
Canungra Gorge	Mount Barney	Upper Numinbah Valley
Cedar Creek (Tamborine)	Mount Coolum	Upper Tallebudgera Valley
Conondale Range	Mount Cooroy	Yandina Remnant Forest
Cooloola	Mount Lindesay	Yarraman Forests
Crows Nest Falls N.P.	Mount Maroon	

For those places which satisfied, or came close to satisfying, the measures set for the indicators of significance, a number of qualitative measures were also considered in arriving at conclusions about which places met the thresholds set for National Estate aesthetic significance. Measures were adapted to gauge the degree of significance of aesthetic value. These took into account whether the aesthetic attributes of a place were comparatively stronger than other like places and whether they were identified by a popular source and corroborated by an expert or evaluated by one. They also considered if type of place was rare in the region; uncommon in the landscape character and type, had a clear form, was prominent or had symbolic importance. In summary, a place qualified if it satisfied some of the indicators of significance and qualitative measures, but more importantly if it could be mapped and could be said to have been intact since depiction (Table 4).

Statements of Significance were drafted for each of the places which passed the thresholds and they were identified on 1:100,000 topographic maps. Six such places (Boonah Pastoral Landscape, Brisbane Bushland, Brisbane Valley Pastoral Landscape, Caloundra, Samford Valley and Upper Mary Valley) were not able to be mapped and were therefore omitted from the final list.

The quality of the data did not allow the exact view depicted to be mapped. For very specific views, it would have been necessary to map the scene shown in every depiction. Broader landscape units encompassing the specific feature, such as a waterfall or peak and its surrounding forest, were used instead. Unfortunately, the study was not allowed time for the boundaries to be checked in the field

This study of aesthetic data recorded artistic depictions of the forest. Just because a place is not depicted and recorded in the study database does not mean that it has no aesthetic value. A systematic analysis of landscape units in the South East Queensland biogeographic region and their mapping at appropriate scales is required as a component of an aesthetics assessment so as to take account of the visual relationships of landscape units. This would allow better information for integrated planning of the management of aesthetic values in the forests.

# Conclusion

The project was one of discovery. Significant contemporary artists and historical figures have been inspired by forest places in the region under study. They ranged from Judith Wright to Peter Carey and Janette Turner Hospital; and from Conrad Martens to Vida Lahey and William Robinson. As the first research of its type undertaken in Queensland, it uncovered testimony to the cultural and aesthetic value of the forests to successive generations, a value which is being rediscovered by a new generation of Queensland artists. Across artistic forms and genres it is apparent that there is an increasing desire of young artists to cite the specificity of place in their works; it indicates a renewed sense of connection to the landscape and forests in the region.

# Acknowledgement

Permission to reproduce part of 'The Forest' by Judith Wright from A human pattern: Selected poems (ETT Imprint: Sydney, 1996) was granted by ETT Imprint.

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# Appendix: Statements of Significance for four popular aesthetic places

# **Bunya Mountains**

The Bunya Mountains are situated at the extreme western edge of the biogeographic region and form an isolated section of the Great Dividing Range about 150 km from the coast. They are comprised of steep slopes rising to a narrow ridge at about 1000 metres which gives views in all directions. Much of the early European history of the region is associated with the timber industry

which contrasts entirely with the Indigenous use of the mountains for ceremonial cycles associated with the bunya nuts. Botanical artist Marianne North was the first international artist to visit the Bunyas in the 1880s at the suggestion of Charles Darwin. Her paintings are now on display at Kew Gardens, England where she first encountered the Bunya Pine.

Further early artistic depictions of the Bunyas were by photographer James Bain in 1892 and the poet Cornelius Moynihan in 1896. George Essex Evans described the Bunya landscape in Garden of Australia 1899 (Powell 1998). Photography of the mountains after 1908 when it was gazetted as a national park became part of the tourist promotion of the area. J.H. Foster took a series of 22 photographs of Barkers Creek and Falls, Bluff Falls and Gorge, Lower and Middle falls of Tim Shea Creek and the falls at Saddle Tree Creek in the Bunya Mountains in the 1920s. The panoramic views from the mountain's spine have continued to inspire photographers such as E.H. Mears in From the Razorback Spur, Bunya Mountain (1930), On the Bunya Mountains, looking over hill and plain towards Dalby. (1930) and Panoramic view from Big Spur on Middle Creek (1926). Other photographers such as J.H. Foster in Pine Trees Towering Above the Scrub (1920) and Sunlight on Bunya Mountains (1920) testify to the region's aesthetic beauty and variety.

Early guest houses ensured that the Bunyas were a popular destination—a trend which continues to this day. Contemporary sculptor John Baird's series of works Key to Bunya Mountains I, II and III are evidence of the aesthetic value of the eastern view of the mountains to contemporary Queensland artists. The Bunya Moutains National Park and adjacent State Forest are highly valued by the community and feature predominantly in tourist literature as one of the landscape icons of the biogeographic region.

#### Fraser Island

Fraser Island is the largest sand island in the world. It is made up of an aged sequence of dune sands that reach a maximum elevation of 240 metres and in places extend 100 metres below sea level. Nine separate dune systems have been recognised above sea level and most of these can be correlated with those of the nearby Cooloola sand mass. Outstanding landscapes of exceptional beauty exist including long uninterrupted sweeps of ocean beach.

The spectacular dune landscape is interspersed with numerous sand blows. With more than forty freshwater dune lakes of diverse size, elevation, shape, depth and colour, and surrounding vegetation. Fraser Island is regarded as a "lake land" of remarkable beauty and interest. Lake Wabby is a spectacular example of a barrage lake. Patches of subtropical rainforest on Fraser Island are outstanding additions to the diversity of the vegetation and scenery of the coastal dunes. The satinay brush box forests and the blackbutt/bloodwood forests of Fraser Island contain giant trees up to 50 metres in height with breast height diameters of up to three metres. These are spectacular examples of subtropical sclerophyll forests which provide scenic diversity and arouse scientific curiosity about the development of such large biomasses on nutrient-poor quartz sands.

The island's scenery is inspirational and provides themes for works by artists and writers. The natural beauty of the area is largely derived from the naturalness, uniqueness, diversity and spatial relationships of land form and vegetation. The description of discrete elements should not obscure an overall impression of integrated landscape character. Henry Stuart Russell in his *The Genesis of Queensland* (1888) provides some of the earliest descriptions of the island as does Thomas Petrie in his *Reminiscences* published in 1904. An extensive collection of early photographs by the Bauer family dating from 1912-1930 give some of the earliest visual images of the island. The most well known writer associated with Fraser Island is Patrick White who, in his novel *A Fringe of Leaves* (1976) drew inspiration from the island.

John Sinclair's autobiographical work Fighting for Fraser Island: A Man and His Island gives the island's controversial political history in the campaign to reserve the island's unique attributes. Photographs by Olive Ashworth published in the Fraser Island Defence Organisation's publication, Fraser Island: Its Past Present and Future (1971) depict the spectacular beauty of the island.

Innovative, contemporary composer Peter Sculthorpe's work *Eliza Frazer Sings* with text by internationally acclaimed writer Barbara Blackman indicates the region's continuing aesthetic value. Conceptually based works by painter Sidney Nolan in his paintings of *Mrs Fraser* (1947) and *Mrs Fraser and Convict* (1962) refer to an important chapter in the island's history. Melville Haysom's *Ugari Middens, Fraser Island* (1951) depicts aspects of Indigenous life and custom. The Thoorgine Aboriginal Interpretative and Cultural Centre on Fraser Island opened in 1996 to preserve aspects of Batjala culture including their aesthetic response to the landscape.

#### Glasshouse Mountains

The Glasshouse Mountains are among the best known landmarks of southern Queensland. The Glasshouse Mountains National Park protects seven of the thirteen distinctive mountains—Beerwah, Tibrogargan, Ngungun, Coonowrin (Crookneck), Miketeebumulgrai, Elimbah (Saddleback), and Coochin Hills—along with Blue Gum Creek Section. The Glasshouses reach an average height of 400m above sea level with the highest, Mt Beerwah, at 556m. The mountains are a series of remnant volcanic plugs composed of rhyolite and trachyte and have changed very little over many thousands of years. Through a process known as columnar jointing the rhyolite forms distinct columns and these are most visible at Coonowrin and Ngungun. The land between the mountains has long been given over to agriculture especially pineapple growing and exotic pine plantations.

The Glasshouses have always been popular with rock climbers. The mountains are spectacular when seen against the backdrop of the surrounding countryside in the early morning or late afternoon. Good viewing positions are the interpretation shelter on Wild Horse Mountain or from the escarpment road near Mary Cairncross Park at Maleny.

The mountains have been depicted continuously for 227 years since Cook first described them as 'Glass houses' in 1770. Matthew Flinders mentioned them in his journal of 1799. International artists such as Geoffrey Dutton, Thomas

Shapcott and David Malouf have all written poetry inspired by the Glasshouses, and writers have also drawn inspiration from the mountains such as Judith Wright in her short story The Mountains Played. Other poets of national standing such as Mocco Wollert and David Phillip Reiter have commemorated the mountains. Innovative contemporary landscape painters such as Lawrence Daws have depicted the mountains in his famous series of works simply entitled Glasshouse Mountains (1980). Fred Williams painting Glasshouse Mountains III (1971) is another important work by an international artist. Important early depictions were by Conrad Martens in 1852, in his Glasshouse Mountains, Moreton Bay Early Morning, Nov 6th, 1851. Douglas Scott Montagu was an early artist depicting the region in 1853, and early photographers such as Charles Ernest Stanley Fryer and G.A. Rowley also depicted the mountains. Other notable artists include William Bustard, P. Hobday Stanhope, Lois Beumer, Max Ragless, Kenneth MacQueen, Jessie Traill, Karl Langer, Gwendolyn Grant and Robert Campbell. Musical works by Robert Davidson in his work Tibrogargan (1996) and John Gilfedder's work Legend of Tibrogargan (1986) testify to the region's aesthetic value and broad ranging appeal to artists.

The community values both the individual peaks that form the Glasshouse Mountains and the remnant forest linking them. The uninterrupted, panoramic views of the Glasshouses from both Wildhorse Mountain Lookout and Mary Cairneross Park are highly valued.

### Scenic Rim

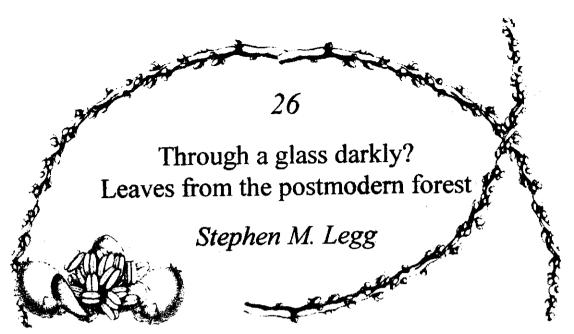
This term was coined by artist and author Arthur Groom and was a name that was given to a curved line of prominent ranges to the south and west of Brisbane. The ranges rise steeply to encircle the coastal lowlands like the rim of a bowl. Stretching for over 22 kilometres, the Rim includes the highest mountain system and the highest mountain peaks in Queensland south of the Wet Tropics. Beginning near Laidley, the Rim runs south along the Little Liverpool Range, Mistake Mountains and Main Range (Part of the Great Divide), then eastward from Wilson's Peak along the McPherson Range and New South Wales border almost to the sea. The ranges include more than forty peaks over 1000 metres high. Twenty peaks are higher than 1200 metres, the highest being Mount Superbus (1375 m). Consequently the Rim encompasses some of the most rugged and scenic landscapes in Queensland. The Scenic Rim contains some of the largest areas of natural vegetation remaining in south-east Queensland and the largest area of rainforest. Vegetation types include subtropical and temperate rainforests, open forests and woodlands.

The majority of the Scenic Rim's parks, some state forest and other state-owned lands have been nominated for World Heritage listing based on their outstanding natural values. The Scenic Rim is also an important recreational resource providing the settings for a variety of nature based outdoor recreational activities, ranging from remote bushwalking and camping to scenic driving and picnicking. The national parks attract over one million visitors per year, contributing significantly to the economy of local communities through recreation and tourism.

In terms of terrain the linear Main Range contrasts with the plateau of the Mistake Mountains, Lamington and Springbrook although all have steep escarpments and cliff lines. There are also relatively isolated peaks, such as the Moogerah Peaks, Mount Barney and Mount Lindesay which all have separate statements of significance. From many viewpoints large sweeps of the Rim may be seen, with the contrasting colours and textures of rainforest and open forest revealing their response to soils, slope and aspect and with broad features of cultural, geological and scenic interest visible in many directions.

The Scenic Rim has been the source of artistic inspiration for at least 146 vears. The most important artist of the colonial period was Conrad Martens who depicted parts of the Rim in Cunningham's Gap from Normanby Plains, 25 Nov (1851), Scrub in Cunningham's Gap (1851), Sketch of a Bottle Tree (1851). Summit of the Old Road, Cunningham's Gap (1851) and View from Main Dividing Range, (1853). Another early depiction was by Douglas Scott Montagu Cunningham's Gap, NSW (1853) and David Powell's Cunningham's Gap. Queensland (1899) and Henry Stuart Russell's description of this country in his work The Genesis of Queensland (1888). Other important artists who painted aspects of the Scenic Rim are Elioth Gruner, Valley of the Tweed (1921), Vida Lahey, From Binna Burra, (1934) and From South Tamborine (1949). The distinctive "Steamer" on the Main Range has been celebrated by Archibald Meston's poem A Storm at Night: Seen from the Top of the McPherson Range (1871), by Rodney Hall in his poem The Climber (1962), and by Raymond Curtis in. In the Strength of Mountains and The Thought of Mountains At Night (1989). An important work that illustrates the continuing aesthetic value of this region is the contemporary music of Colin Brumby The Vision and the Gap (1984) with its libretto by the author Thomas Shapcott.

Arthur Groom was perhaps the best known artist associated with the region. He coined the name 'Scenic Rim' in his 1949 work *One Mountain After Another* where he described his vision of a plan to ensure the scenic quality of the region. He had submitted it to the Queensland Government some years before. It sought to preserve the scenic/aesthetic value of the rim of mountains that swing in a wide arc from Point Danger at the Pacific Ocean as far inland as Cunningham's Gap.



For now we see through a glass, darkly; but then face to face: now I know in part; but then shall I know even as also I am known.

(1 Corinthians 13:12)

# What is a postmodernist critique?

First, we need to distinguish between 'postmodernism' (not just postindustrialism) as the present condition of western, or at least westernized, late-capitalism, and emerging from it, the type of postmodernist analysis which has become a defining feature of our increasingly disillusioned and fragmented society. Incorporated in both the condition and the analysis may be a critique, and usually a rejection, of the 'modern' era which has dominated our lives since late last century. Initially born out of art and literary criticism, postmodernist critiques are now found throughout all of the humanities, and are also challenging the sciences. Although they have added to old disciplines and created new ones; they are essentially interdisciplinary. While these critiques are still largely confined to academia, the general public is increasingly familiar with popular postmodern art, literature, marketing, technology and music along with the spectre of globalisation. Many postmodern scholars encourage 'logocentric deconstruction'—a language-centred examination of the hidden layers of meaning in texts, notably the very values, attitudes, and perspectives that shaped and still pervade our view of ourselves, our judgement and treatment of others, and our encounter with the world around us. But there is no reason why landscapes could not be regarded as 'texts' revealing the 'hand of Man' in this sense. Postmodernist critiques of other places, times and cultures may show the narratives with which we structure, interpret, and justify our own history and geography. Thus, it is claimed, postmodernist critiques can shed new light on the past and how we see it (historiography). The stuff of which our culture and identity is forged may be present in the dialogues, 'stories', or 'discourses' which empower, engender and define us; in our collective myths and memories; in the symbols that we construct to give meaning to our 'semiotically' rich world; in landscapes tame and wild, indeed in Nature and the Universe and our dealings with it.

Striving for this new 'type of knowing', this 'reflexiveness' (a separation of ourselves from 'the other' in all things) is one of the characteristics of postmodernism. This is a view which goes further than conventional contextualisation, or 'grounding' of behaviour by understanding motives and perceptions. It is more than a humanistic rejection of the postivistic foundations of modern science, economy, government and rationality; and it goes beyond the acceptance of the 'relativism' associated with 'idealist' philosophies which reject our comfortable modern notions of objectivity and morality such as those implicated in our commodification of both Nature and people. To its adherents it is certainly more than just a New Age vogue, and they claim that it is more than a new epistemology, philosophy or religion. For, in its extreme forms, postmodernism causes many to question the very essence of being; of time, space, truth and reality. For some, postmodernist critiques (and there is no single or even a consensus view) may provide both ends and means—a way to, and a reason for, transcending, for example, the Cartesian view of time-space that binds and blinkers us to particular notions of stability, change and progress. The new critiques may reveal a world in which all of Nature is viewed as a cultural construct, in which nature and humanity, observer and observed, are both false dichotomies—a metaphysical world of endless possibilities defined, and actually created, by thought. That is an unsettling vision which is far from a mere acknowledgment that landscapes are an amalgam of culture and Nature. It is frightening for many, yet refreshing for some.

As both ends and means, postmodernist critiques have been variously ignored, reviled, ridiculed and rejected by conventional (modern) theorists—and perhaps rightly so. The early works, for example of the 'Deconstructive Postmodernists' associated with the French post-structuralists such as Lyotard, Derrida, and Baudrillard, were notoriously abstract and nihilistic. In their 'projects' to explain repression, exploitation and domination, postmodern scholars were seen as focussing almost exclusively on the dark and dismal (Jencks quoted in Appignanesi and Garratt 1995: 3). The unconventional structure of many postmodern works, their high-level language, rejection of meta-theory and narrative form, the notion that meaning may run counter to the authors' assertions and that the possible interpretations are as varied as the readers' perspectives, rarely appealed to a wider audience. Even with the emergence of the 'more creative and constructive' postmodernist critiques from the 1980s, many of the resultant studies are pretentious. hyper-critical and naive; they can be deterministic and myopic, and they are frequently dismissed as superficial. They are often contradictory, particularly when they merely substitute one narrative for another, having earlier rejected narrativisation; or when they write history from structuralist frames of reference

that are essentially ahistorical. Conventional theorists claim that much of their work has been ignored or unfairly judged, and that what the postmodernists regard as new has been, or can be, incorporated by traditional methods. Certainly, conventional theorists reject any suggestion that all of their work needs to be supplanted. And, not surprisingly, there is a widespread reaction to the new reason, morality and political correctness. Nevertheless, all of these faults are not exclusive to any radical intellectual movement and much of the work has definitely been misrepresented and misunderstood. Thus, the postmodern historian, Poster (1997: 35) responds to the criticism that post-structuralist ideas are 'threats to reality' by noting that 'ironically, the historian and the structuralist are in agreement about the certainty of the truth, one seeing it as an attribute of reality, the other as an attribute of language'.

# Forest history and postmodernist critiques

The debate still rages, but there is no doubt that postmodernists have become more numerous, influential and pervasive. Although there is currently no recognisable postmodern genre in forest history, elements of the critique are already emerging in more conventional works. The result is that our interpretations of forest history (no less than our dealings with contemporary forest issues) will increasingly be informed by, and judged from, postmodernist perspectives. The challenge has long ago been mounted within disciplines which have traditionally informed our writings: including history (especially its cultural and environmental variants and heritage studies), geography (human, cultural, and historical), and archaeology. New interdisciplinary areas such as environmental ethics, feminism, cultural studies, and post-colonialism are also generating some relevant material. In the remainder of this short and admittedly selective paper (which is a preliminary foray for a more systematic and extensive study) I note a few representative works on key elements of postmodernism especially as they relate to historical studies, as well as considering specific examples affecting forest history.

Useful overviews of the literature are given by Connor (1989), Harvey (1989) and Rose (1991) on culture and the postmodern condition; Rosenau (1992) on the implications for the social sciences; Jameson on late capitalism (1984 and 1991); and Soja (1987, 1993), Jackson (1989), Simmons (1993), Benco and Strohmayer (1997), Dear and Flusty (1998), and Ogborn (1999) on the spread of postmodern geography. Ogborn considers the possibility of an idealist historical geography whose task would be focussed on the human use and habitation of the earth as a function of human thought' (p.95). He sees environmental history as histories of power relations that need to be deconstructed, and seeks 'to understand the social or cultural construction of spaces, knowledges and powers...while coming to some accommodation between the discursive and the material' (p.103). Poster (1997) deals with the shift from social to cultural history and opposition to 'the main tendencies of contemporary historiography—its realist assumption about the past, its totalising frameworks, and its empiricism' (Poster 1997: 110). Even the occasionally frivolous survey of the development of postmodernism by

Appignanesi and Garratt (1995) is useful. A spirited defence of positivism and empiricism is mounted in Barnes et al. (1996).

Basic texts dealing with discourse, especially those relating to power and legitimation include Foucault (1972); Habermas (1976); White (1978, 1990); Burton and Carlen (1979); Mchoul (1982), Macdonnell (1986); and Mchoul and Grace (1993). Case studies dealing with 'official' discourse include Burton and Carlen (1979); Macdonnell (1986); and Gelder and Jacobs (1998). Specifically environmental issues are dealt with by Mercer (1987) on forest management in Victoria, Whitelaw (1993) and Igler (1996) on legal discourse in land and river management, Bennett and Chaloupka (1993) analysing the way language, culture and disciplines 'capture and construct environmental discourse and thought', Wilson (1997) on deconstructing conflicts over the reintroduction of wolves into Yellowstone National Park, Whatmore and Thorne (1998) on the history of the classification of wildlife, Dizard (1994) on how differing social constructions of nature influence the debate over hunting, Litmanen (1996) who deconstructs the language of nuclear waste conflicts in Finland, Litfin (1994) who incorporates 'a Foucaultian equation of power and knowledge' to deconstruct the ozone depletion debate, and Myerson and Rydin (1996) on how environmental conflicts portrayed by the mass media. Although a more conventional 'ecocriticism'. Buell's (1995) tome lends itself to a postmodernist critique of American nature writing; while Takacs (1996) critiques the narratives of biologists and conservationists who deploy the concept of biodiversity. Payne's (1998: 39) analysis of the influence of nature writing on American environmental policy reminds us that deconstructions of this type have significance beyond literary criticism or antiquarianism because 'few if any...genres have been as closely tied with political reform'. This observation is paralleled in the literary critique of policy narratives by Emery (1994).

It is interesting that postmodernist critiques are increasingly incorporating conventional software and hardware developed for qualitative analyses of texts and other discourses essentially designed to 'objectify' as well as streamline their sampling techniques. The software includes Nudist, Wordcruncher, Readware, and Text Pack, along with improved search facilities for electronic databases—see Myerson and Rydin (1996), Lamb and Morris (1997), and for its clear methodological exposition see the analysis of values contained in over 15,000 'stories' on U.S. National Forests in Xu and Bengston (1997). The journal Discourse and Society contains many novel postmodern approaches and methods to a variety of topics.

A narrower focus on selected issues is taken in the following exceptional works. They clearly demonstrate the utility of postmodern critiques in a wide variety of areas: White's (1973, 1978, 1990), Phillips (1997) and Olafson's (1979) analyses of meta-narratives with which we structure the past and interpret history; Said's (1978, 1993) and Lewis and Wigen's (1997) studies of western imperialism and our views of the Orient; Attwood's (1989), Sutton's (1995), Layton's (1995), Strang's (1997) and Gelder's and Jacobs' (1998) challenging analyses of modern views of Australian Aboriginal society, geography and

history; Rose's (1993), Plumwood's (1993) and McEwan's (1998) feminist critiques of the 'gendering' of space and nature respectively; and a variety of local postcolonial studies highlighting the impact of dominant colonial discourses on people and landscapes including Moore and Vaughan (1994), Darian-Smith et al. (1996), McCann (1997), and Lester (1998). Gow (1995) and Gell (1995) consider the discourse of forest peoples and forest lands; while von Engelhardt (1997) considers the nature/history nexus in German natural history around 1800. Robertson et al. (1996), Simmons (1993), Proctor (1998) and Ogborn (1999) explore postmodern conceptualisations of nature from a cultural perspective, particularly in terms of reconciling scientific and non-scientific 'theories and discourses'. Together, these cultural geographies of landscape explore the notion that landscape is a way of seeing (Cosgrove 1985) and they note that there are 'as many ways of seeing as there are eyes to see' (Jackson 1989: 177; see also Entrikin 1991).

Postmodernist approaches to environmental history include Williams (1980); Flores (1994); Robbins (1993) and Cronon (1992, 1996a, 1995); while Eder (1996) offers a more conventional view. Many essentially philosophical studies of contemporary environmental ethics also offer useful frameworks for historical analyses. The latter group includes Gottlieb (1993); Callicott (1996); Raglan and Scholtmeijer (1996); and even Langston's (1995) analysis of conflicts over old growth forests. Not all works on recent environmental discourses are relevant for historical applications—the works by Darier, Levy and Rutherford in Darier (1999) promise much but deliver little in this regard. As Levy (1999: 207) states ominously: 'The further we follow Foucault, it seems, the less he offers us'; although there are some possibilities with the application of Foucaultian notions of biopolitics. Coates (1996) provides a useful overview of the increasing diversity of Anglo-American environmental history; while a more conventional history of changing perceptions in 'ecological discourses' is sketched by Lowenthal (1997). Radkau's (1997) historical study 'deconstructs' the language of nature worship in German forestry.

Cronon's works have engendered strong reactions. J. Donald Hughes' (1995) paper was stimulated by Cronon's 1992 work. In 1992, Cronon was still ambivalent about postmodernist views. By 1995, however, Cronon was perceived as a strong advocate of postmodernist critiques of environmental history. His work was criticised by Soule and Lease (1995) and by each of Hays, Cohen and Dunlap in the inaugural 1996 edition of *Environmental History*. The latter authors dealt mainly with Cronon's 1996a essay which was regarded as an attack on the hallowed (and romanticised) notion of wilderness, but he replied not unreasonably that:

If in fleeing to the wilderness we imagine that we are leaving one nature for another, a fallen for an unfallen world, then we are indeed embarking on an impossible journey back to a nature that has never existed outside our own heads. It is a journey—to a nature whose implications and consequences I regard as 'wrong'—that I hope we will be wise enough not to make' (Cronon 1996b: 55).

Cronon's 1995 work, *Uncommon Ground*, was a compilation of sixteen essays by various authors unified by the view, according to one critic, that 'nature does not exist as a thing in itself and that nature is a cultural construction contingent upon human definition'.

In their critique of postmodern environmental history, Soule and Lease (1995) admit that scientific ecology is pervaded by myths but remain alarmed at the deconstructionists' own mythology (about the nature of Nature, and the morality of western values) as well as their politically-biased 'attack on objectivism and scientific knowledge'. Katherine Hayles (1995), one of the contributors to Reinventing Nature, raises the persistent issue that bedevils conservationists over the postmodernist critique: 'If nature is only a social construction, why fight hard to preserve it?' Or as Ian Simmons puts the same problem:

Deriving essentially from French literary criticism of the 1970s, postmodernism is best known for its espousal of 'deconstruction'. Deconstruction thinks of the world as being constructed of language and hence there can be slippage between the object and its signification in words. So the foundations of rationality established in the Enlightenment of the 18th century no longer exist: there are only local and contingent truths (Rosenau 1992). For environmental concern, this has a frightening aspect, for if the natural sciences indeed have no epistemological foundation, then there is no truthful information about the world, and humans might as well behave totally in their own immediate interests. (Simmons 1997: 288).

For the environmental historian Donald Worster (1994: 11), the root of the problem is the amoral postmodern historicism which:

gives us freedom from dogma but no guidance to belief. It cannot really invalidate the intellectual tendencies of our time, or any other time, nor validate new ones. On the contrary, it can only lead either to complete cynicism or to the acceptance of any ideas or any landscapes that humans have created as legitimate ... If the study of human or natural history required us to adopt such a rigid historicist position, then I would be ready to join those who call for the wholesale rejection of modern historical consciousness as a degenerate world view.

For the doctrinaire 'degenerate' relativist or idealist historian, the pursuit of a logically consistent world view poses the dilemma of possibly having to legitimise even morally outrageous or 'politically incorrect' historical interpretations despite contrary evidence, for example with regard to incidences of genocide.

# Australian scene

Cronon's postmodernist critiques might prove problematic to 'conventional' Australian environmental historians, who, like Stephen Dovers (1994, 1995) generally take the realist position that environments comprise both biophysical and cultural components, and who may also argue for 'pragmatic' histories that assist contemporary conservation movements. George Seddon's (1997) work is somewhat different, although he is equally aware of the need for pragmatics.

Seddon's reflections on place and space in the Australian context deals, in part, with his own struggle to come to terms with, but ultimately his enthusiasm for, postmodern works. Given his early involvement in the non-positivistic examination of environmental perceptions (Seddon and Davis 1976; for a fuller discussion see Legg 1995), it is not surprising to find the conventional statement that: 'The ways in which we perceive, imagine, conceptualise, image, verbalise, relate to, behave towards the natural world are the product of cultural conditioning and individual variation' (Seddon 1997, 13). His apparently conflicting—but he insists 'mutually enhancing'—training in Geology, English, Philosophy and Environmental Science provided a background for, amongst a wide range of interests, his research and writing of environmental history. The potential conflict between humanities and hard science is particularly instructive. Seddon enthusiastically embraces the postmodernist creed that 'language structures our map of reality', although he remains ambivalent about the possibility of 'a world out there independent of our perceptions of it'. He engages with the postcolonial view (see also Powell 1988a, 1988b and other humanistic analyses) that even 'objective science' was dominated by a Eurocentric discourse, and perhaps most pertinent for our conference shows the changing images and perceptions of the rainforest in which science supplied only one 'gaze'. But it is his championing of Carter's (1987) Road to Botany Bay and what he sees as the central thesis of that work that is of note:

Bourgeois society is ruled by equivalence. It makes the dissimilar comparable by reducing it to abstract quantities. To the Enlightenment, that which does not reduce to numbers, and ultimately to the one, becomes illusion; modern positivism writes it off as literature.' (Carter 1987: 211 quoted in Seddon 1997: 43).

Conventional theorists may well feel that this is nothing new. For example, fifteen years earlier, Mercer and Powell (1972) had noted the same tendencies:

Human geographers appear to be increasingly inclined towards such a view-point which emphasises the richness of man's experiences and his perception of the world. Behavioural science attempts to tone down as far as possible the existence of *variations* in human attitudes and behaviour; and yet current trends within our subject, we believe, show growing dissatisfaction with this levelling down process. The concepts of 'space' and 'distance'—so basic to our discipline—have been investigated in especially great detail over the past two decades, and each year witnesses the further differentiation of these concepts in a direction which is well away from a single 'objective' notion of space and towards a multi-faceted experiential definition...

In addition to the works of Seddon, Sutton and Attwood, five closely-related recent postmodern histories of colonial Australia have done much to popularise the challenge to conventional historical narratives and methodologies: Carter (1987, 1996), Dixon (1995), Ryan (1996), and Haynes (1998). Carter's deeply philosophical 'spatial histories' are, perhaps, the most difficult to read and the most challenging conceptually, but they are also the most rewarding for their scholarship and breadth. His (1996) Lie of the Land revises and extends some of

the premises from his earlier work which had something of a mixed reception—not only by a public frustrated by his writing style, but also by historians and historical geographers who were glibly dismissed for their 'diorama mentality' (1987: xxi). Australian historical geographers have focussed on the culture/nature dialogue as a painful and gradual coming to terms with the harsh realities of an alien land (see Legg 1995 for an extended discussion). But Carter calls for 'a different conception of the land and our relationship to it' (p.365), one that is locally 'grounded' and avoids 'the planar floor of linear history' (p.366). He states that 'space itself is a distinctively Western concept' (p.366) and that 'space philosophies' cannot be disembodied from a peoples' history (p.367). In a typically abstract passage, he explores the complex meaning of enclosure, to possess and control the land, and relates this to 'clearing' which:

at least as it applies to the process of colonization, involves a double enclosure act. It means a physical division of the land; but before that, it entails a prior conceptual enclosure act in which the 'Ground' is subsumed within the category of 'Land'. The clearing-away of obstacles—tree stumps, obstinate slopes, rocks inconveniently scattered in one's path, dense passages of bush-masquerades as the disclosure of a land for all, it seems to increase the quantity of space available for settlement. But the impression of an extended ground, the revelation, say, of a topography, is illusory; 'occupation means clearing', as one settler succinctly remarks, because to clear is to neutralise the lie of the land and, by minimizing local differences, to prepare the way for linear inscription and division. Colonial history begins when and where the 'Governor marked out the Lines for Encampment'. Denving the charge of a common ground, clearing neutralizes the lie of the land; producing the ideological enclosure act essential to colonization's selflegitimation, it gives historical significance to that ambiguous phrase's other connotation. But this passage from ground to land equally describes the biographical colonization of subjectivity, its determination to set the ego against its environment... (p.217).

Ryan's 1996 The Cartographic Eye refines and develops the spatial aspects of the postmodernist attack on the Cartesian logic of Australia's early explorers and surveyors. He presents the most doctrinaire of these works in his often scathing attack on the white invaders. He deconstructs their colonial discourses dominated by 'the gaze of ownership', their assumed moral superiority over the blacks, and the methods by which they 'culturally constructed the landscape'. He agrees that 'Carter is fundamentally correct...land cannot exist before it is culturally assimilated' (p.17). Haynes' 1998 Seeking the Centre offers a popular and attractive survey of the Australian encounter with the centre of our continent in a book which is the most accessible for a general audience. Acknowledging the influence of both Carter and Ryan, she gives useful summaries of the postmodernist and especially the postcolonial genre, and effectively demonstrates the profound differences in cultural perceptions of the desert between indigenous and white Australians. Thus, for the Aborigines the land 'was a map', and it was unimaginable that the centre was 'deserted' in any of the many senses of that word (from godforsaken to uninhabited). Dixon's (1995) Writing the Colonial

Adventure is one of a remarkable surge in postcolonial and cultural analyses of the discourse of colonialism (not only in Australia), and is particularly informative on the Western encounter with indigenous peoples and Nature. In the European mind, and despite the evidence to the contrary, the land seemed a wilderness.

## Forest as artefact?

Since the last Australian national forest history conference in 1996, the publication of Simon Schama's monumental (1996) Landscape and Memory has been singularly important in popularising forest history to an international audience (on the role of memory in history see Hutton 1993). Although far from a postmodernist critique, and despite its idiosyncratic and occasionally self-indulgent autobiographical style, Landscape and Memory parallels, and has added to the legitimacy of many of the key themes discussed above. Like Cronon, Schama probes a variety of 'nature myths' concerning wood, water, and rock and provides a strong critique of conventional environmental historians and conservationists alike especially in relation to the cultural construction of wilderness. Thus, in both the New World and the Old: 'although we are accustomed to separate nature and human perception into two realms, they are, in fact, indivisible. Before it can ever be a repose for the senses, landscape is the work of the mind. Its scenery is built up as much from memory as from layers of rock' (pp.6-7). It seemed to Schama that: 'neither the frontiers between the wild and the cultivated, nor those that lie between the past and the present, are so easily fixed. Whether we scramble the slopes or ramble the woods, our Western sensibilities carry a bulging backpack of myth and recollection' (p.574).

The debate over the social construction of nature, especially as it pertains to iconic 'wilderness' continues, but for the purposes of this paper is best developed by Proctor (1998) who examines various forms of 'relativism', as he would call the postmodernist historicism. He feels that the threats are not as serious as some would have us believe and that a reproachment is possible by combining elements of two philosophies: critical realism and a more 'agnostic' pragmatism. This would allow a recognition that all knowledges are partial and that a certain degree of relativism is unavoidable, and yet still 'point to ways that geographers and others whose business and concern it is to represent nature can indeed have something to say' (p.352).

Similar themes pervade the 'conventional' works of Australian environmental and forest historians, many of whom have contributed to our Society's own conferences. Colleagues at Victoria's Historic Places Branch, public historians Jane Lennon, Charles Fahey, Tom Griffiths, and Anita Brady have each noted the selective 'denial' of the human history of forest areas in favour of the conservation of wrongly-assumed natural landscapes, and the tensions that these conflicts engender: see Lennon (1988), Fahey (1991), Griffiths (1991, 1992), and Brady (1993). Wang et al. (1996) show that similar problems face heritage managers in the U.S. Forest Service when they attempt to preserve evidence of the timber industry as 'cultural landscapes'. Another aspect comprises the popular ignorance

of the extent and duration of Aboriginal occupation of pre-European forests in Australia: see for example Boutland (1988), Pyne (1991), Birtles (1997), and Douglas (1997), and even the notion that the forests might post-date European settlement (for example Rolls 1981). Similar conclusions are reached by Fairhead and Leach (1996) who examine the history of human interaction in the African savanna and conclude that previous experts had got it wrong 'by reading forest history backwards'.

Radkau's postmodernist critique (1997: 236) explores this problematic perception of naturalness and wildness in German forestry history (in a way which sheds light on the notion of 'old-growth forests', a key theme of the third Australian national forest history conference in 1996):

Since the late nineteenth century, the idea of the 'natural forest' (naturn-naher wald) has gained growing popularity in German forestry teaching. But again we have to scrutinize the practical effect of this ideological trend. It would be erroneous to identify the history of forestry ideas with the real history of forests. Sometimes ideas are a negative picture of reality. The idea of nature in German forestry arose foremost as a critical reaction against misfortunes caused by rigid general rules, by clear-cutting and by coniferous monocultures. In the mid-nineteenth century the revival of the idea of nature was especially a reaction against the challenge of the so-called Bodenrein-ertragslehre (doctrine of net land yield), consistently oriented toward short-term financial gains. The stronger commercial forestry became in reality, the stronger the notion of nature became in the ideational sphere. Sometimes the idea of nature appears like a symbolic compensation for the factual course of events!

The postmodernist critique will probably challenge the very core of the positivistic, empirical, often imperial, generally male-dominated, politically conservative, training and experiences (Dargavel 1980) of the foresters, timber workers, and volunteer industrial archaeologists who form a backbone to forest history research around the world. Perhaps they are least likely to change their view of the forest. In addition there are traditionally-trained biological and physical scientists whose realist conception of the world would be up-ended. As Ian Simmons puts it: 'To break away from thirty years of science-based empirical research into this sort of material is a considerable risk' (Simmons 1993: xiii). However, it is still possible even from a 'conventional' scientific stance to acknowledge, like Nakashima (1998), that 'resource management is not the exclusive domain of scientific thought and practice. It forms an integral part of the ways-of-knowing, ways-of-life and world views of many societies and cultural groups (p.21). Thus:

the way we conceptualize nature and the manner in which we manage our relationship with the natural world reveals a great deal about 'who we are'. Natural resource management systems are truly cultural manifestations of society (p.22).

For many forest historians, the postmodernist critique may represent an intellectual divide larger than that represented by the environmental movement or deep ecology back in the 1960s and 1970s (see the 'environmental challenge' in Legg

1988, 1995). But without the popular mass support, and with apparently few implications for management policy and prescription 'on the ground', the results may appear much less threatening. There may also be resistance to postmodernism from environmentalists and others whose romantic interpretations of the forests will leave little room for alternative narratives, or for those who like Dovers (1994) advocate praxis: practical action to change the future. Then there are those researchers inclined toward meta-theories as a means of structuring historical narratives—including, for example, Dargavel's (1995) use of 'resource regimes', Dunlap's (1995) 'reciprocal influences', Hughes' 'ecological processes' (1995), or the 'ecological imperialism' suggested by Crosby (1986), Worster (1994), Griffiths and Robin (1997), Grove (1995), Mackenzie (1997) and a host of others. The proper scale of research is a complex issue. Both 'conventional' and postmodern environmental histories range from the local to the global. Thus, there are useful local 'forest stories' (history 'in the' forest) such as Angela Taylor's Forester's Log (1998) along with the type of regional and global analysis advocated by Griffiths (1997: 12). Local studies abound in postmodern literature, if only because:

As Yi-Fu Tuan wrote two decades ago in Topohilia, affection for history, as with place, tends to focus on smaller and more personal scales than the large political boundaries of the modern world, and human sense of place has everything to do with a shared sense of history (quoted in Flores 1994: 12).

Somewhat contradictorily, perhaps, the postcolonial, feminist, and other deconstructuralists also work on the scale of grand historical narratives especially as a contribution to the recognition and overthrow of oppression from dominant discourses.

In terms of the research agenda for Australian forest historians, there seems little doubt that there will be resistance to the postmodernist critique; it is simply too alien for a simple substitution with conventional works, and in most cases it is too profound a philosophical shift to accommodate. Perhaps we will have to wait for the current generation of historians trained in the postmodernist critique to turn their attention to Australian forest history. In addition, there is still so much infilling' remaining to be done along existing lines of inquiry such as those themes identified at our Forest History Society's first three national conferences

Nevertheless, it may be overstating the case to suggest that conventional works cannot be informed by postmodernist critiques (or indeed that the communication cannot work both ways). Perhaps, as with the child given a toy hammer who discovers that everything needs hammering, we will have to wait until the current rush to deconstruct' subsides and a more mature approach evolves. We have already noted some striking parallels in the methodologies and conclusions in the work of both groups, and certainly there are considerable opportunities for a fruitful review of existing research from the new perspective. In the case of my own research dealing with forest history (for example Legg 1977, 1984, 1988, 1992, 1995), I have become far more aware of how value-laden our assumptions and perceptions are, of how selective and impressionistic our research might become despite attempts at 'objectivity' or thoroughness, of how similar even apparently

conflicting or contradictory narratives might seem, and literally how subjective the constitution of our historical subject can become. I can even see how meanings can be radically altered by simple changes to structures, narrative styles and sequences in research and writing. In sum, a postmodernist perspective can at least assist our appreciation of the potential dissonance between reality and our portrayal of it. And these are the confessions of a 'conventional' forest historian trained in a diverse disciplinary background with a life-long passion for studying the way history is written as narratives, the nature and origins of historical interpretations, and the role of myth and misperception especially as they relate to reconstructions of past landscapes and the human encounter with nature.

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## Understanding

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