

The Planted Landscape: forest transformation in the Upper Clarence catchment, northern NSW

Jane L. Lennon

Introduction

There is a forgotten country below the New England tableland and rising to the Queensland border - the Upper Clarence valley lying west of the Richmond Range. It is an area of about 4000 sq. kms. The steep eastern falls of the Great Dividing Range were heavily forested and the 'Big River' was fringed with cedar. It is Gidabal country, a dialect group of the Bundajalung people. But it is forgotten in terms of socio-economic development, despite its nineteenth century history of promise, and is now an area of declining population, a backwater between the coast and the Queensland border. For over a century there was interest in extending the forested landscape by planting softwood forests to reduce reliance on imported timber and more latterly to provide hardwoods to replace the supplies locked up in old growth forested national parks. This paper traces that evolution.

The forest landscape

The forested ranges between 200 m and 1200 m above sea level contain lush subtropical rainforest in the most protected moist gullies, with moist hardwoods, mainly eucalypts, on fertile soils resulting from past volcanic activity in localities of higher altitude and rainfall. Dry hardwood forests occur on the less fertile sedimentary soils, although they may contain patches of dry rainforest on the wetter sites within these.

Moist hardwoods in the region were the most intensively managed forest type by the Forestry Commission of New South Wales (made into a corporation in 2013). Commercial species include tallow wood (*E. microcorys*), blue gum (*E. saligna*), white stringy bark (*E. globoidea*), flooded gum (*E. grandis*), white gum (*E. dunnii*) and brush box (*Lophostemon confertus*). The main dry hardwoods include many naturally durable timbers such as ironbark (*E. siderophloia*), red gum (*E. tereticornis*), grey gum (*E. propinqua*), white mahogany (*E. acmenioides*), spotted gum (*Corymbia citriodora* var. *variegata*) and grey box (*E. mollucana*).

Rainfall ranges from 1650mm on the eastern boundary to less than 1025mm over the western boundary. This region forms part of the Clarence–Moreton Basin comprising a number of Jurassic sedimentary units including the Mallanganee Coal Seams. However the most obvious geologic features of the landscape reflect extensive volcanic activity that took place in the Tertiary over 20 million years ago. Basaltic soils derived from the Tertiary volcanic flows occur on the steeper slopes of the catchment and are generally fertile and well drained. Alluvial soils occur on the floodplains of the major creeks and rivers.

As a result of the range of forest types and a century and a half of forest use, there is a large range of wildlife habitats. This diversity, in conjunction with revegetating and partially cleared adjoining lands, provides habitat for one of the richest concentrations of mammals anywhere in Australia. Ten species of macropods occur in the area (Forests Commission, 1989). In 1989 one of the best remaining areas of Hoop pine dry rainforest was in the Mallanganee Forest Reserve. National Parks in Kyogle Shire cover 34475 ha in the Border Ranges, Toonumbar, Richmond Range, Mallanganee and Mt Nothofagus National Parks.

The area is of great importance to local Aboriginal people with a network of cultural sites such as creation places, ceremonial sites, traditional pathways and evidence of past occupation. Places of significance are widely distributed through the forested uplands indicating that these were intensely occupied and over 130 sites had been recorded by 2009 (Kyogle Council, 2009). Since the inception of the *NSW Land Rights Act 1983*, the Muli Muli Local Aboriginal Land Council, based at Woodenbong and Jubullum Local Aboriginal Land Council based at Tabulam have jurisdiction over the area and the Githabul people have local connections.

Nineteenth century occupation

The Aboriginal landscapes of the Upper Clarence were first visited by a European in the late 1820s. Richard Craig was a young convict who escaped from Moreton Bay penal settlement and was befriended by Aborigines in the area where he lived for several years travelling with them until his recapture at Port Macquarie in 1831. His accounts of the area led to sawmillers venturing up the 'Big River' in 1836 to begin exploitation of the cedar known colloquially as 'red gold'. In 1837 Craig guided squatters with flocks of sheep to the Clarence. The rough line of track from Tenterfield on the top of the tableland down to the Clarence River was used by Edward Ogilvie who crossed at Tabulum in 1839 and took up land to the south at Yugilbar, while John Pagan and his brother in law, William Evans took up Tabulum east and west respectively (Wilkinson 1980:3-5). By 1840 stations were dotted along the Clarence.

The Clarence River was regarded as the 'natural shipping port' for the New England squatters and about 1840 dray traffic began traversing the rugged country from Tenterfield to Tabulum and then down the Clarence via Yugilbar and Gordonbrook to Copmanhurst and Grafton (Stubbs 2009:2). Thomas Hewitt blazed the route in 1842 from Tenterfield to Sandy Hills, Fairfield (Drake), Tabulum, Busby's Flat, Wyan, where it forked - north to The Crossing (Casino) and south to Grafton (Keats 1988:95). In 1841 Robert Smith and family settled at Fairfield, which was a 160 acre outstation of Yugilbar, at the bottom of the difficult descent from the Tableland on Plumbago Creek. Fairfield became the nucleus of the village of Drake, while the surrounding area was known as Cheviot Hills (Wilkinson 1980:6-8).

The first squatter to come north of Tabulum was John Donald [Jock] McLean (1821-66). He came from the Hunter Valley in 1841 and took up *Bunalbo* pastoral lease. His shepherd Ted Naughton lived at Peacock Creek from late 1840s and Donald McLean with sheep and family were at Bean Creek in 1848 – all located on *Bunalbo* (Ralston 1987:6-7).

Adjoining *Bunalbo* to the south was *Sandilands* occupied by Thomas Robertson in 1848. To the north *Bunalbo* adjoined Woodenbong and on the west Tooloom. McLean sold *Bunalbo* to William and Jane Robertson in 1853 and they also bought *Sandilands* from her brothers [also Robertsons – Thomas and Richard]. In 1858 Jane Robertson [husband William died on arrival in Sydney] and five daughters plus nursemaid Una Coe arrived by ship at Lawrence and then took three days in a spring cart to reach *Sandilands*. By 1862 *Bunalbo* homestead was completed; it was built of cedar, pit-sawn on site,

shingled roof, shady verandahs, terraced garden laid out by Frederick Eversham who had trained at Royal Gardens Kew. He later planted trees around Una Coe's grave on the property in 1864 and Jane Robertson's in 1876 (Figure 1).



Figure 1: Graves of Una Coe [1864] and Jane Robertson [1876] *Bunalbo*

William had assisted his mother in managing the station under Superintendent George Cole and employed Aboriginal stockmen including Thomas Hinett but drought and pleuro pneumonia decimated the 3000 head of cattle. William sold to Henry Barnes of *Dyraaba* in 1878 and in 1888 moved to Sydney. Richard also sold *Sandilands* in 1878 to C. A. Bruxner and moved to Brisbane (Ralston 1987: 8-9).

The discovery of gold in the Upper Clarence in the late 1850s transformed the settlement pattern as thousands were attracted to the forgotten country. New townships and new roads and tracks developed –Timbarra, Lunatic Reef, Pretty Gully, Tooloom –and from then until the end of the century there were enough finds to keep interest alive although the population varied enormously (Wilson, 1980:16). The discovery of gold at Drake in 1886 revived that township and extended it to Rossiterville in the 1890s as silver had been discovered there in 1887 (Stubbs 2009:34, 40). The impact of these goldfield settlements on the forest landscape was severe but mostly localised.

Despite the passing of the Robertson's Free Selection Act in 1861, the first selectors did not arrive on *Bunalbo* until 1887 when Donald McIntyre took up 640 acres at *Ivanhoe* on Peacock Creek at present day Bonalbo. He eked out a living selling beef to timber getters and working periodically as a stockman on *Bunalbo*. Jane Robertson's family had selected some of their run about 1880 with Dick's selection on the Clarence [now Lance Hooton's]. John Barling was the surveyor employed to cut up *Bunalbo*. William Ralston managed the remnants of *Bunalbo* until all the blocks were sold and he and his sisters

took up blocks on Sandy Creek in 1905. McIntyre sold *Ivanhoe* to Paddy McNamee in 1902 (Ralston 1987:15).

Closer settlement and forest management

Red Cedar (*Toona ciliata*) and Rosewood (*Dysoxylon fraserianum*) were culled from forests before they were thrown open for selection, but millions of feet of timber were destroyed to make way for agricultural development. Attempts to arrest unrestricted cutting were made in 1871 when the first Timber Reserves were gazetted, which included 'magnificent forests of brush and hardwood in the Clarence Pastoral Districts' (Forest Branch, 1883). But only two were anywhere close to the study area – those at Timbarra [no.7 of 49 sq.miles] and Shannon Brook [no.5 of 125 sq.miles] (Grant 1989:60-61). In 1875 William Carron was made 'inspector of forests and forestry ranger' for the Clarence River district and reported on existing forest reserves and recommended gazettal of new reserves (Carron 1985).

Cedar cutters came to the upper Clarence around 1880, some 40 years later than on the lower Clarence due to the difficulty in transporting logs to ports on the coastal rivers (Abbott and Lennon 2005:7). For example, although cedar getters entered Yabbra scrub in 1880 led by an Aboriginal stockman, Diamond, from *Bunalbo* station, it was a long trip to a port. Teamsters hauled timber from the Haystack after it had been skidded over Bald Knob, to Old Bonalbo and Mallanganee to Irvington wharf on the Richmond – a 30 day return trip. The cedar getting industry foundered by 1887 due to competition from imported American mahogany and falling prices (Ralston 1987:28) and presumably from overcutting of the resource. Large areas of forest were declared Forest Reserves as early as 1887.

While initial interest in the forest as a timber resource concentrated on the logging of red cedar (*Toona ciliata*), hoop pine (*Araucaria cunninghamii*) and white beech (*Gmelina leichhardtii*) were also felled. In the early 1900s general sawmilling commenced in the area.

By 1908 Thomas Hewittson, who owned the sawmill at the village of Sandilands [as Mallanganee was referred to until the 1917 proclamation of it as a village], was employing 12 men and had 19 bullock teams drawing timber to and from his mill. In 1910 the village was 'a hive of activity' and a 'timber centre in every sense of the word' with logs of all sizes and kinds (quoted in Stubbs 2009:77). The successful introduction of sawmills west of the range and the continued occupation of a few selections on Gorge, Galaxy and Culmaran Creeks caused intending settlers to come – E.J. Little on Bottle Creek in 1906 [he had been a drover since 1901 and knew the country] and Edward Rogers and David Harvey on Peacock Creek in 1907 (Ralston 1987:17).

The pastoral lands of the Upper Clarence were also attracting an increasing population and the Department of Lands commented in 1910 that 'partly by reason of the better lands near townships being alienated, and partly by new roads affording better access – almost a rush has set in to secure lands on Bonalbo, Tabulum, Gordonbrook, Yugilbar and Newbold runs' (quoted in Stubbs 2009:87). This 'rush' resulted in much clearing of forest cover.

In 1900, F.J. Carlson built a mill near the present crossing of Bottle Creek solely for supplying bridge girders and decking for the bridge then under construction across the Clarence at Tabulum. Stan Priest of Mullumbimby then followed with a mill about a mile north [on what is now the Amos' property]. Hoop pine stands were seemingly endless and a buyer's market demanded faultless logs from an area so bountifully supplied with soft and hard woods. The millers had no alternative but to cut down the very best, forcing the fellers and bullockies to be equally discriminating. Nevertheless, there was gross wastage. In 1918 Priest's second mill was erected on banks of Peacock Creek at Bonalbo and by 1921

it became the Bonalbo Sawmilling Co; by 1930 there were up to 50 teams supplying the rebuilt and modernised mill which pursued a policy of expansion (Ralston 1987:28).

With the passing of the first NSW forestry legislation, the *Forestry Act 1909*, public forests were to be examined to decide which should be permanently dedicated as 'state forests' and which should remain temporarily reserved as 'timber reserves.' By 1913 only 53,000 acres had been proclaimed as state forests and included Acacia Creek and Koreelah State Forest no.1 and Mandle & Beaury State Forest no.2 in the extreme northern portion of the Clarence River catchment (Grant 1989:62). By the end of 1913, the first 45 State Forests had been proclaimed comprising about 320,000 acres and 29 of these were situated within the Counties of Rous, Richmond, Clarence, Fitzroy and Buller, that is in the Northern Rivers region indicating the importance of the region's forests and the urgency of having them protected (Stubbs and Lennon 2010:20-21).

Pressure to revoke State Forests in favour of clearing for agriculture increased following World War I. This was resisted by gazettal of those areas most under threat as National Forest under New South Wales legislation passed in 1935 which made State Forests even more secure from revocation. The first National Forest was Manning River on the mid north coast in 1936 followed by Nightcap north of Lismore in 1937 (Grant 1989:60-2).

Many small sawmills operated throughout the district each drawing both rainforest and hardwood (mainly eucalypt) logs from adjacent forest areas from the 1930s until the 1980s. Villages grew up around such mills, such as at Woodenbong, Urbenville, Old Bonalbo, Bonalbo and Mallanganee. The working class rural communities of these towns valued their knowledge of forestry skills (Dargavel 1995:134) and this extended to Aboriginal men employed as fellers in the forest (Langford 1988:9, 30).

Improvements in roads and road transport led to the demise of small mills and the building of fewer but larger mills in local towns in the last decade such as at Casino and Kyogle. Mounting community pressure from the 1980s for rainforest protection led to transfer of State Forests to National Park starting with the Border Ranges in 1982. However, timber production in the Urbenville Management Area had been falling since the mid 1960s despite supplying the expanding Brisbane market (Forests Commission of NSW 1989:7, 10).

Plantations in the Clarence valley region

Hoop pine was the second native softwood species, after red cedar, to be exploited on a large scale in the Upper Clarence. Larger quantities were cut compared with red cedar and it was a much more important commercial species. The 1908 Royal Commission on Forestry made recommendations about the dwindling supply of hoop pine recommending that 'methods of sowing and planting' be resorted to in order to 'maintain a continuous supply of this timber.' But exotic pine planting was pursued instead and 25 years later in 1933, only 63 acres of hoop pine had been planted – at Mt Pikapene on the Richmond Range in Casino forestry district (Stubbs and Lennon 2010:14). This was incrementally expanded to 492 ha by 1978 (Grant 1989:170).

The *Forestry (Amendment) Act 1935* was enforced by new Commissioner, E. H. F. Swain, who had championed the cause of native conifer plantations in the 1920s and 1930s in Queensland. In 1936 and 1937 the Forestry Commission moved to re-establish hoop pine in its native habitat in northern NSW and established a nursery in East Dorrigo district. Meanwhile the Commission had also initiated a plan of management for reforestation of hoop pine forests at the head of the Clarence River. Urbenville was selected as the headquarters of forestry operations for the district and the inaugural ceremony for this project was performed by Lieutenant-Colonel Michael Bruxner, Deputy Premier, and son of the *Sandilands* run owner. An office and nursery were opened and by 30 June 1941 nearly

600 acres of hoop and bunya pine had been planted (Stubbs and Lennon 2010:15). These plantations were at Koreelah SF, Acacia Plateau, Beaury Creek, Toonumbar and Tooloom.

Planting ceased during World War II but nurseries were built at Mt Pikapene and Roseberry, the latter to supply Toonumbar State Forest in which 194 ha of hoop pine had been planted by 1952. The total area of indigenous conifer plantation reached 3517 acres by 1952 – hoop pine [82 acres planted 1924-35; 2832 acres planted 1938-51], bunya pine (*Araucaria bidwillii*) 592 acres planted 1939-51; Queensland kauri pine (*Agathis robusta*) -11 acres planted 1950-51. During the summer of 1953-4 the plantations were extended by 311 acres, about the normal increment, but then a wet summer following made burning the clearfelled area for planting impossible and only 74 acres were added making a total of 4116 acres.

The Forestry Commission decided in 1956 that the program was not warranted primarily because of 'increasingly high nursery, establishment and tending costs.' It had been realised by the late 1940s that *Araucaria* planting could not be extended greatly in northern NSW due to the limitation of suitable rainforest type country for the plantations, which were expected to peak at 30-40,000 acres. Only Urbenville district was in subtropical rainforest as Mt Pikapene and Toonumbar were dry rainforest. However, limited plantings of hoop and bunya pine were carried out in Beaury SF in 1969, 1975, 1977 and 1978 so that in total 941 hectares of plantation were established. The Roseberry nursery continued until the 1980s as a specialist regional hoop pine nursery (Lennon 2010:185). In comparison exotic plantations of *Pinus* species were generally established on poorer quality soils and the exotic pine planting program remained vigorous across NSW outside of the north with 61,500 acres at the end of 1956 (Stubbs and Lennon 2010:16-17).

Forest 'reforms' and Eucalypt plantations

In June 1990, the Forestry Commission released a strategy for the preparation of Environmental Impact Statements (EISs) prior to logging, which imposed a moratorium on areas that had never been logged such as the Duck Creek area in Richmond Range State Forest. In 1992, Commonwealth, State and Territory Governments agreed to the National Forest Policy Statement, which identified national goals within a regionally based framework. In 1995, the New South Wales Government announced forest reforms aimed at preserving high conservation value old growth and wilderness and establishing a viable, internationally competitive timber industry. Two proposed national parks were notified, one including the majority of the Duck Creek area and the other in Beaury State Forest. The reforms also temporarily excluded other areas of forest pending the completion of a comprehensive regional assessment (Abbott and Lennon 2005:12).

In mid 1990s the NSW government began establishing new eucalypt plantations specifically to replace wood supplies from native forests that had been transferred to conservation reserves as a result of the Regional Forest Agreements. These were planted on cleared land that had been purchased or leased from private landholders. By 2008 Forests NSW (formerly the Forestry Commission of New South Wales) had planted about 26,000 ha including some in the Upper Clarence (Figure 2).

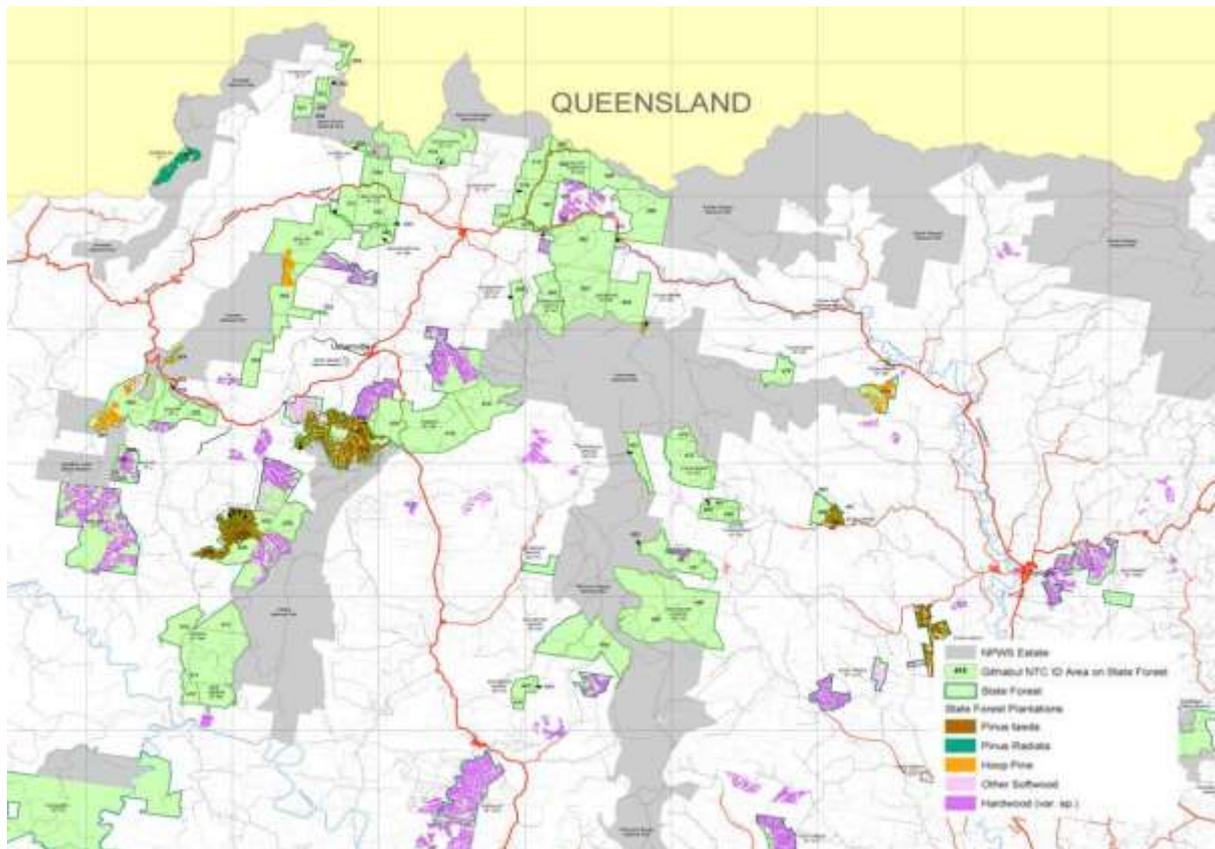


Figure 2: Map showing plantation areas in the Upper Clarence valley, September 2003. *Source:* State Forests NSW.

The Commonwealth Government introduced new forestry-specific rules to enable tax deductibility of establishment costs in or near the year they were incurred for forestry-based Managed Investment Schemes (MIS). This was originally intended to encourage plantation establishment, both softwood and hardwood, for the production of sawlogs – as part of a National Forest Policy to expand the plantation resource in response to the progressive reductions in supply of sawlogs from the native forest estate with the transfer of timber resources into conservation reserves (Ferguson 2014:162). Australia's plantation estate is unlikely to reach 3 million hectares by 2020, as envisaged by the 1997 *Plantations for Australia: The 2020 Vision*. If the current plantation area of 2 million ha is maintained, total wood production from softwood plantations is expected to plateau by 2035 at 18 million cubic metres per year. Total production from hardwood plantations will peak at around 15 million cubic metres per year by 2030. Just over half of the plantation estate comprises softwoods (mostly pine) grown mainly for sawlogs, with the remainder comprising hardwoods (mostly eucalypts) grown mainly on short rotation for the pulp and paper industries. The softwood plantation area has been stable since 1990. In contrast, the hardwood plantation area expanded rapidly from 1996 to 2009, mainly driven by managed investment schemes (Forest Industry Advisory Council 2015:19-20).

Plantations in NSW are currently managed under four scenarios:

- Plantations approved under the *Plantations and Reafforestation Act 1999* (PRA) from Dec 2001 to the present);
- Plantations accredited under the *Timber Plantations (Harvest Guarantee) Act 1995* (TPHGA) between July 1997 and Dec 2001;
- Existing plantations > 30 ha that predate the PRA and the TPHGA, and have not been authorised under either regulation. These must be authorised under the PRA before they can be re-planted; and

- Smaller plantations of 30 ha or less, classed as Exempt Farm Forestry, that do not need to be authorised under the PRA provided that any clearing of native vegetation is exempt from approval requirements under the *Native Vegetation Act 2003*.

Of the 181,472 ha of plantation authorised between December 2001 and June 2011, approximately 69,937 ha were softwood plantations (*Pinus* spp). Hardwood plantations accounted for about 84,701 ha, other species and cabinet timber plantations for 7,911 ha, and environmental plantings for carbon sequestration for 20,269 ha.

By June 2011 there were 283 MIS established plantations covering an area of 81,499 ha. This accounts for 37% of the area of plantations authorised under the PRA. The remaining 49% of the area of authorised plantations is in the ownership of individuals and other plantation companies. The involvement of individuals and private companies has increased dramatically in 2009-2010 and 2010-2011.

For the period December 2001 to June 2011 the majority of plantation establishment activity was on the North Coast within the then Northern Rivers Catchment Management Authority area which covered most of the Upper Clarence area and almost 70% of authorisations during 2010-11 were in the Northern Rivers (Garrard 2011).

In New South Wales and Queensland increases in land prices were generally well in excess of inflation, partly due to the competition for land engendered by the Managed Investment Schemes, where bidding for land immediately prior to the end of the financial year sometimes became cut-throat under the peculiarities of the tax treatment. However, other factors were at work, especially in areas around major rural towns where competition for hobby farms became pronounced, as evident around Lismore (Ferguson 2014:167).

The issue of 'sovereign risk' is associated with possible changes of regulatory controls by governments at all levels, given the long periods involved in growing plantations. While controls are needed, governments need to be mindful of the perverse effects that rapid and recurring changes can bring to investment in plantations especially for local government (Ibid.). In the Shire of Kyogle planning scheme plantations are an as-of-right use in the rural zone. The Kyogle Local Environment Plan 2012 has four rural zones relating to forestry: RU3 Forestry and RU1 Primary Production, RU2 Rural Landscape and RU4 Primary Production Small Lots where Forestry is permitted with consent.

In the Upper Clarence private companies began planting hardwoods and plantations belonging to Forest Enterprises Australia (FEA), Great Southern Plantations (GSP) and Integrated Tree Cropping (ITC) made up about half of the subtropical eucalypt plantation estate established since 1994. These new hardwood plantations represent a locally significant change of land use in the Upper Clarence catchment around Woodenbong and Bonalbo. The pace and extent of planting has created discontent in these local communities. Concern has been expressed about depopulation (families selling their farms for plantations and leaving the district), aerial spraying of plantations with insecticides, and fire risk among other issues (Stubbs and Lennon 2010:22-23).

While the collapse of most MIS may have eroded interest for a time, there is nevertheless a strong latent interest among farmers because of inter-related trends proceeding in agriculture: aging farmers may wish to reduce their workload by leasing land for plantations; asset-rich but cash-poor farmers eventually need to realise on their assets in order to support moving off the farm and into retirement, and increased farm sizes with associated mechanization and technological improvements has led to a 20% reduction in the number of farms from 1990-2005 (Ferguson 2014:168).

Extension efforts for farm forestry have emphasised the multiple benefits of forestry and its contribution to income diversification. On-farm benefits include: shelter for stock and crops; soil conservation, salinity mitigation and water catchment protection; and improving biodiversity, habitat and other landscape and aesthetic values. However, to be adopted by more farming enterprises, farm forestry also needs to generate good economic returns. The integration of forestry into farm landscapes—as opposed to the replacement of farms with broadscale forestry plantations—is more likely to be accepted by farming communities. However, this approach presents challenges in terms of achieving economies of scale for forestry activities on-farm and regionally. Other factors influencing the feasibility of farm forestry include: harvest and transport logistics and costs; knowledge of forest product markets and forest management practices; and regulations for establishing and managing on-farm plantations (Forest Industry Advisory Council 2015:19-20).

Haulage distance is the more critical factor to the economics than is scale of planting or harvesting especially in the Upper Clarence. The principal risk in farm forestry relates to the prices of thinnings and final crop and is significant because most large industrial forestry estates sell to large processors on a take or pay basis. This means that farm forestry growers have found it difficult to sell logs when the timber industry is in a cyclical trough. However, a large proportion of the hardwood plantation estate established under MIS will be harvested in the near future and there is no surety that these areas will be replanted. It is therefore possible that the plantation hardwood estate, specifically the short-rotation fibre plantations, may shrink in coming years. The lack of investment in expanding both the softwood and hardwood plantation estate is a key issue for the sector (Forest Industry Advisory Council 2015: 20).

Properties that have proven to be undesirable forestry sites are moving back to traditional grazing, cropping or dairy and this is happening in the Upper Clarence. The outlook for agriculture is so positive that the gap was narrowing. The 2014 update of Australian plantation statistics published by the Department of Agriculture showed that more hardwood plantations were taken out than were planted in the past year (Hopkins 2014).

The era of large-scale government intervention and support for forestry in Australia now appears to be ending. Softwood plantations owned by state governments are now systematically being sold to institutional investors, and the MIS forestry estate has been sold into institutional owners (New Forests Asset Management Pty Limited 2015). The failure of the MIS industry is in some ways a reflection of the inherent problem of using tax inducements to fund an industry. Stimulation will be required to accelerate planting again for an estimated 36,000,000 population by 2045, which is only 30 years away.

The Australian plantation industry and Australian governments are ‘stalled at an intersection of many paths and are confronted by many conflicting signals’ (Ferguson 2014:169). Key issues are how much of the short rotation hardwood plantations planted for woodchip or pulping will continue to be replanted and managed after initial harvesting, how much will be converted to softwoods, and how much will change land use to agriculture or other uses? The problems are too complex, inter-related and yet spread so widely and thinly. Ironically, the perverse outcomes bear heaviest on the Australian Government’s climate policy, because the loss of plantation area could represent a material change in the Government’s estimates of improvement in the carbon budget by 2020 (Ibid.).

A century of change in Bottle Creek valley

As part of the *Sandilands* and then *Dyraaba runs*, Bottle Creek valley had little disturbance other than the track north over Peacock Range and Gorge Creek. Beef cattle, mostly Herefords, were raised and

stock agents from Victoria made periodic visits resulting in selection of cattle and mobs being sold and 'put on the road' under the charge of drovers for the long walk to their destination (Ralston 1987:24).

The first selector of newly subdivided blocks along Bottle Creek was E. J. Little in 1906. Selectors cleared the valuable timber to create dairy farms supplying the Bonalbo Co-operative Dairy Company which opened in September 1911 (Ralston 1987:33). For the five years prior to this cream was carried in saddle bags over a difficult bridle track to the factory at Urbenville. The Medhurst, Crowther, and Kennedy families arrived in Bottle Creek in 1909 and supplied milk to the Bonalbo factory when it opened (Ralston 1987:19). Ed Medhurst was in charge of the factory steam boiler which had voracious appetite for forest oak (*Casuarina sp.*), the supply of which was an industry in itself (Ralston 1987:33).

Bottle Creek Public School opened in 1913 and there was a strong community spirit; in 1951 there were still 19 children attending. In 1958 the school closed and the building was moved to Tunglebung where it became the community hall (Tart and Tucker 2011:10).

After World War I when some of the young selectors did not return, clearing and developing dairy farms continued. Pigs, mostly Berkshires, were also raised and fed on skim milk, corn and pumpkins and driven over the Richmond Range on the travelling stock route to the Casino market. In 1922 Bill Cooke was hauling huge pine logs from Bottle Creek to the mill at Bonalbo (Ralston 1987:29). Bottle Creek hall opened in 1932 and was a popular venue district wide; it finally closed in 1974 (Ralston 1987:59). There was a twice weekly mail service by horse and dray in the 1930s. All weather roads were a priority but lacking and in 1927 work commenced on a gravel road to Bonalbo via Bottle Creek and it was completed using 'susso' labour in 1936 (Ralston 1987:65-6). Bottle Creek farmer, W.R [Bill] Cooke, BEM, was elected to the Shire of Kyogle Council in 1942 and served until 1953.

After World War II dairying continued with a number of dairies run on a share system supplying the Norco factory in Bonalbo. Ruby Langford evoked the town life and its rhythms in Bonalbo and the tight knit network of dairy farms radiating up and down the nearby creek valleys with the truck calling to pick up the 'big cream cans' (Langford 1988:11, 39-40). Its butter was of export quality and won several overseas awards but in 1967, as a result of decreasing numbers of suppliers, butter production moved to Kyogle and the milk supply ceased in 1972 when the factory was sold (Ralston 1987:35).

In 1950 the Bonalbo sawmill had 56 staff and a Woodman's Club. In 1960 it was razed by fire and rebuilt but sold to Duncan Holdings in 1965. Duncan's mill at Sandilands replaced the Bonalbo and Mallanganee mills in 1969; it was opened by Hon. Tim Bruxner, MLA for Tenterfield, and was said to be one of the most impressive timber plants in the southern hemisphere with a circular sorting table and residue burners (Ralston 1987:31).

By the late 1960s dairy farming was in decline in Bottle Creek valley and farmers turned to beef production and some property consolidation. And so 60 years on this history shows why today's setting of Bottle Creek is cleared hills! (Figure 3).



Figure 3: Bottle Creek – village centre top

But a new land use soon arrived –plantations –to reclothe the slopes. This also led to population loss and property amalgamations so that Bonalbo’s population fell from 337 in 2001 to 313 in 2006 and there was a 5 % decline in population between 1996 and 2001 in the Shire of Kyogle rural areas.

The NSW Department of Lands 1:25000 orthophoto map for Tunglebung [9440-3N] covers the whole of Bottle Creek valley from its source below Peacock Hill [571m asl] on the Peacock range an outlier of the Richmond Range, south west to its debouchment into the Clarence River two kms above Tabulum. Bottle Creek valley bisects the Bonalbo State Forest (SF 1070) with Peacock Creek to the north and Tunglebung Creek to the south. Of 25,600 ha there are 4400 ha of plantations.

Near the headwater on Peacock range, Forest Enterprises Australia bought *Rogara* and planted the higher slopes with spotted gum and the lower slopes with Dunn’s white gum –*E. dunnii* which the locals refer to as ‘E. gunna die’ as many areas were rapidly planted in the few months leading to the end of the financial year without adequate preparation as is shown by the poor growth rates. There has been no management in the interim since the MIS collapse and the large forest is now owned by a new corporation, Resource Management Service.

Along Bottle Creek, *Huondale* to the north and *Gilgai* to the south were developed as dairy farms. Abutting there Townsend bought 12 acres and leased the timber reserve for many years (Ron Petty, pers. comm. 21 July 2010). Townsend moved his house from the flood prone banks of Bottle Creek–the ‘island’ –to the Clarence Way. Petty’s house was moved over from Dr Tierney’s block in 1959. The State School and the hall, which finally closed in 1974 and was moved away, were between the two existing houses. There was a tennis court south of these and a stock dip and yards on the north side of the Creek. The tick inspectors’ huts were located in the TSR on the north side of our gate. This was the nucleus of Bottle Creek village.

After World War II, Townsend and Billy Cooke still worked bullock teams at *The Grange* hauling timber from ‘Brown Mountain’ on Peacock Range. Monica Petty still calls Brown Mountain ‘Cook’s Mountain’. Townsend cut spotted gum out of our ‘Telstra paddock’ every 10 years. He let a German who had arrived after World War II [John Lezinski] cut sleepers from red gum in our ‘top forest’. He lived in a railway carriage. Ron Petty cut bloodwood posts there too; a lot of sleepers were cut with broad axes and squared (Monica Petty, pers. comm., 21 July 2010). A cutter’s camp was located near ‘Dam

Creek’—the dunny can, truck chassis, bottles and metal bits were distinguishing artefacts. Ron did lot of mustering in these ranges when he was a ‘tickie’ inspecting herds which had to have three applications of insecticide in 21 days.

The Taylor Lennon plantation has been established on 30 ha land purchased in 2007 –previously a Travelling Stock Route from 1903, then timber reserve post WW2. In 2007 a permit to plant hardwoods on 20 ha was granted (Figure 4).

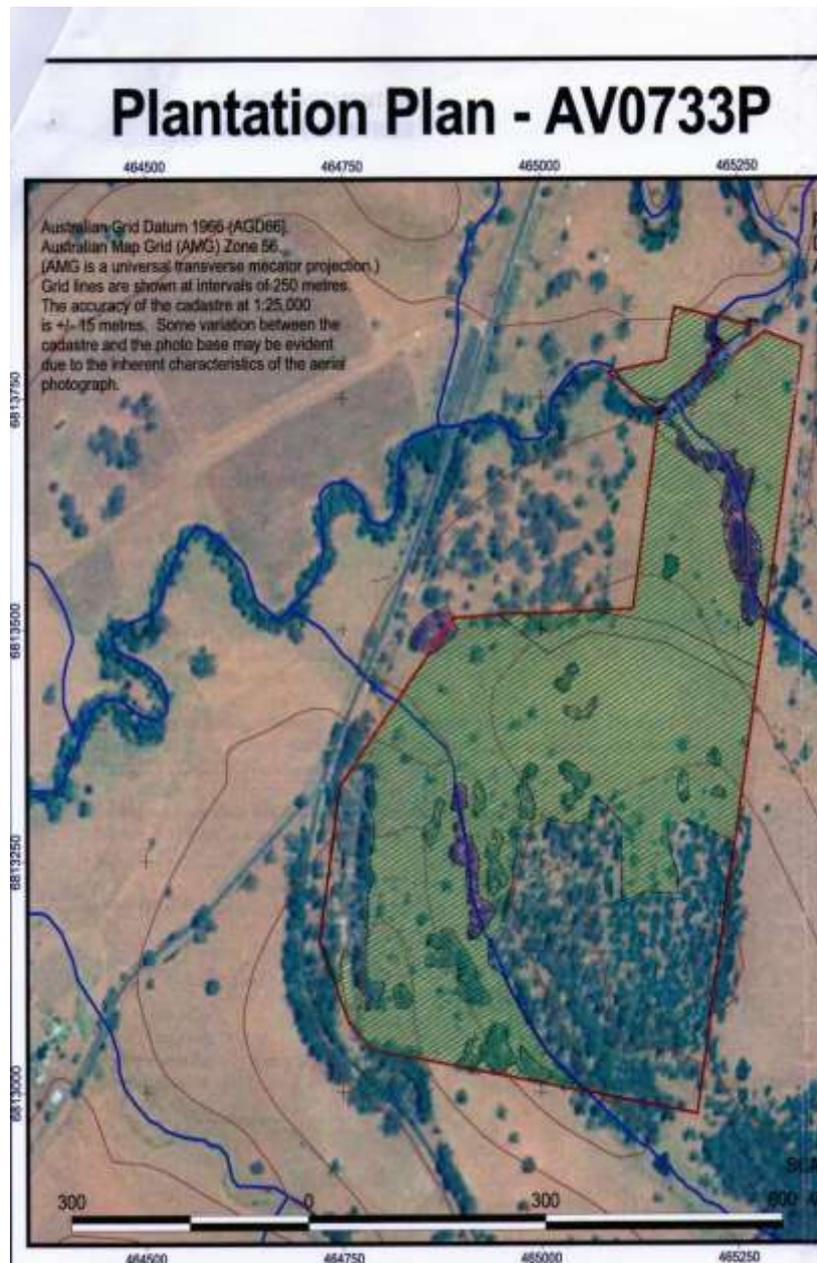


Figure 4: Authorisation for timber plantation, 20th August 2007.

Corymbia citridora var. *variegata* and *Eucalyptus saligna* seed was bought and germinated in a forest grower’s nursery. The plantation site was contour ploughed and the native forest and three creeks fenced off; 12 ha planted in Feb 2009; pruning and thinning commenced in 2010 (Figure 5).



Figure 5: Thinned plantations at Bottle Creek – *Corymbia citriodora* July 2015.

By 2015, there was growth to 700 stems per ha with the objective of supplying the spotted gum pole market (Taylor 2014).

The Tabulum road runs south west off the north-south Clarence Way just over Bottle Creek bridge. Smiths had a successful dairy farm on the creek flats and later subdivided their top paddocks for their son and for later non-farming residents. They are now retired and run a few beef. Robertsons had the next creek-side property now also running a few beef. At Lower Bottle Creek, State Forests developed eucalypt plantations on land leased from Cox and further downstream from Swan. These large plantations wrap around the original Bonalbo State Forest and are currently for sale.

There are no dairy farms left and all remaining residents are either retired or work off-farm, with one new family of lifestylers. The original sellers of land for plantations have left.

What will the future landscape look like? Cleared of eucalypt plantations will it revert to grazing land or be abandoned to regrowth? In the next valley, the Tunglebung, *Pinus elliotii* has been planted (Figure 6).



Figure 6: Mt Pikapene and new pine plantations above Tunglebung Creek.

Is this the sign of the future given the nation-wide shortfall in production for domestic consumption mentioned previously?

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