

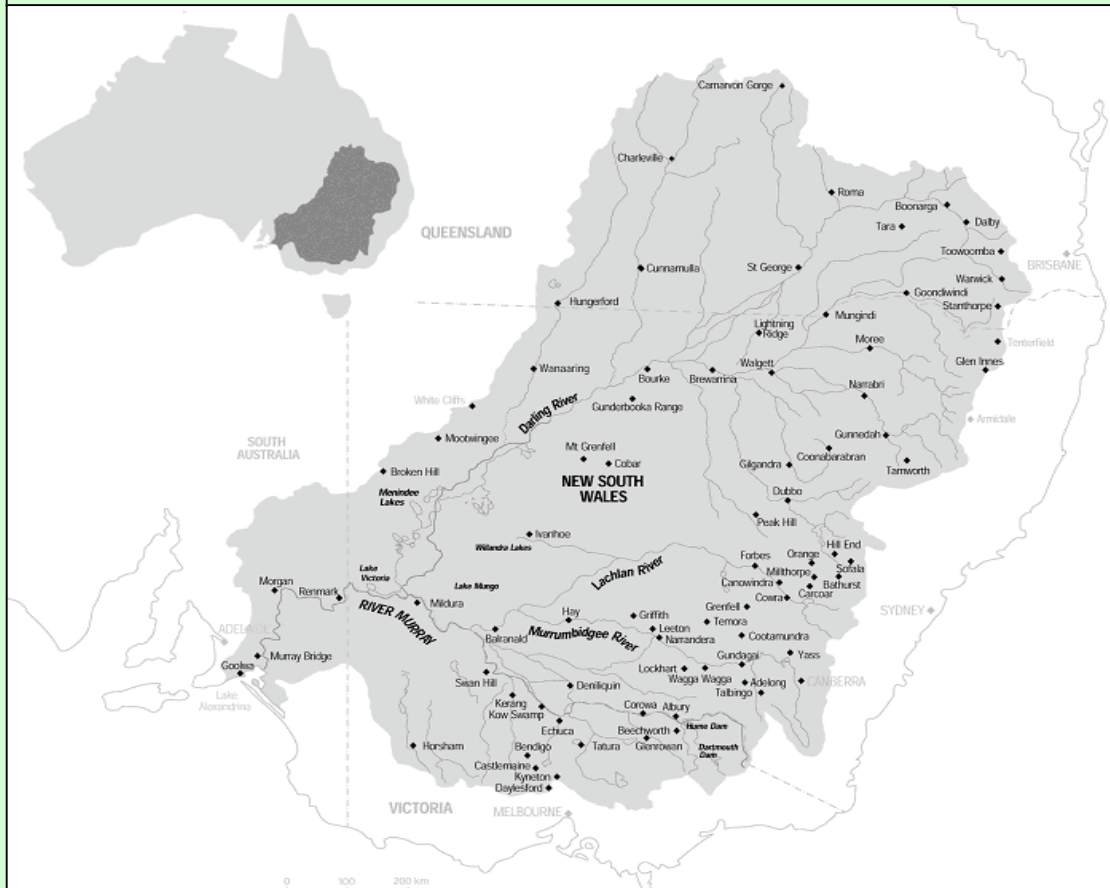
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A Wik Forestry Industry on Cape York Peninsula: Visions and Realities

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The large, unutilised native forest timber resource on traditional Wik land on Cape York Peninsula, Australia, could be managed for timber production to contribute to Wik socio-economic objectives. Wik elders have a set of forestry objectives and envisage that these will be best achieved by a timber industry selling unprocessed logs and woodchips. On the other hand, Balkanu Cape York Development Corporation, an indigenous community development organisation, anticipate that an industry utilising high-technology equipment and producing dried and dressed finished products including strip-flooring will best satisfy Wik forestry objectives. The Wilderness Society envisages small-scale, 'community development' activities such as portable sawmilling and niche market furniture manufacture as being appropriate types of forestry activities on Wik land. Goal programming analysis of forest use opportunities indicates that Wik forestry objectives are unlikely to be best satisfied by adopting the timber utilisation opportunities espoused by any one of the stakeholders.

Keywords: communal forestry, goal programming, Aurukun community, indigenous land rights

INTRODUCTION

Forests are a source of a variety of foods, medicines, building materials and fuels that have sustained indigenous people throughout the world for thousands of years. Contemporary forestry economic researchers have focussed on the importance of forest-based livelihood activities for indigenous communities in developing countries – a theme that is taken up by other contributors in this issue. However, forests are also a potentially important engine for development in socio-economically disadvantaged indigenous communities in developed countries. While much of the literature about forest-based livelihood activities for indigenous people in developed countries has focused on non-timber forest products (e.g. Sofield 2002, Boxall *et al.* 2003, Griffiths *et al.* 2003), the focus here is on timber production.

In Australia, Canada, New Zealand and the United States, indigenous people were displaced from traditional land to make way for settlers and have typically held limited enforceable property rights to traditional land and other natural resources. However, native title rights to natural resources, including forests, have been strengthened in these countries during the last 30 years. For example the Waitangi Tribunal, established in 1975 to provide a legal process by which New Zealand Maori treaty claims could be investigated, resulted in Maoris acquiring substantial forest interests through native title being granted over plantation forestland (MAF 2001). In Canada, recent court rulings regarding Aboriginal title, modern treaty-making processes and forest certification (which include provisions regarding Aboriginal involvement) have led to greater involvement of First Nations people in forestry (Parsons and Prest 2003). In the United States, many tribes have taken over forest management responsibility from the Bureau of Indian Affairs through a process known as

‘compacting’ (Fiedler 2004). Two landmark Australian High Court cases – *Mabo v State of Queensland 1992* and *Wik Peoples v State of Queensland and Others 1996* – introduced native title to Australian law and determined that native title could coexist on land subject to a pastoral lease, respectively. The Mabo and Wik decisions paved the way for rights to be conferred on indigenous claimants to utilise timber on traditional land.

Participation in forestry activities varies considerably between indigenous communities in developed countries. In the United States, a few tribes including the Mescalero Apaches in New Mexico and the White River Apaches in Arizona, own and operate sawmills. The forestry activities of most tribes with forestland are limited to management and harvesting, with logs typically sold to non-indigenous processing facilities. Most tribes with forestlands harvest only moderate volumes, and some harvest little or none (Fiedler 2004). Parsons and Prest (2003) reported that forestry participation in Canadian First Nations communities is similarly diverse. Many remote Australian indigenous communities have long milled timber for local use, including those in the Cape York Peninsula (CYP) townships of Aurukun, Injinoo, Kowanyama, Napranum, Pormpuraaw, Hopevale and Lockhart River. These activities have typically operated on a periodic and non-commercial basis, with equipment remaining idle for years and operating funds provided by various mission administrations or work-for-welfare schemes, notably the Community Development Employment Program (CDEP) (Dale 1993, Wannan 1995, Norman 1999, Cotter 2000). However, a literature review and discussions with people working in indigenous communities by the author failed to identify any commercially successful indigenous forestry enterprises in Australia.

National Governments of developed countries are increasingly recognising the potential for forest management to contribute to economic development in indigenous communities. For example, in 1996 the Canadian Federal Government developed a forestry strategy, the *First Nations Forestry Program*, as part of its plan to secure a better future for indigenous communities (NRC and INAC 2004). Agriculture, Fisheries and Forestry Australia (AFFA) and the Aboriginal and Torres Strait Islander Commission (ATSIC) are presently jointly funding the development of a National Indigenous Forestry Strategy (NIFS). This strategy aims to provide long-term benefits to indigenous communities through increasing participation levels in forest growing, timber processing and non-timber forest products (AFFA 2003).

The Australian Federal and Queensland Governments consider the timber industry to have an important role in generating employment and improving living standards in indigenous communities on CYP in north Queensland (CYRAG 1997, Department of the Premier and Cabinet 2000). The CYP region of northern Australia has a high coincidence of current and claimable indigenous land and commercially valuable forests. However, CYP is also a region of major conservation significance, with the largest continuous tract of tropical savanna remaining on Earth, a high degree of strict species endemism and floristically unique vegetation types (Mackey *et al.* 2001). Over the last five years, the indigenous communities of Aurukun, Lockhart River, Napranum and Injinoo have sought and received forestry assessments of their timber resources and considerable training in timber harvesting and portable sawmilling (Annandale *et al.* 2002, Rogers 2003, Annandale 2004). Balkanu Cape York Development Corporation (Balkanu)¹, with the support of the Queensland Department of State Development and Innovation and Department of Premier and Cabinet, has prepared a scoping document for a joint-venture between a north Queensland sawmiller and the

¹ Balkanu is a government-funded community development agency working for indigenous people on CYP.

Napranum Aboriginal community that involves salvage logging of 8,000 m³ of logs annually from mining leases for milling and strip-flooring manufacture (Shaft 2003).

In 2000, the author was invited by Balkanu and the Australian Centre for International Agricultural Research to assess the financial feasibility of establishing an indigenous forestry industry on the traditional lands of Wik, Wik-Way and Kugu people (collectively referred to here as Wik people) on the Cape. This paper discusses the contrasting forest management objectives and visions of Wik people, Balkanu and the environmental organisation, *The Wilderness Society*, and compares these with a set of timber utilisation opportunities identified by goal programming.

The following section defines the study area and describes the social and economic conditions of Wik people and their natural resource base. Next, the cultural and economic significance of CYP forests for conservationists and Wik people is discussed. Property rights of the Wik to timber resources are then examined. Wik, Balkanu and The Wilderness Society's forestry objectives and the timber utilisation options by which the stakeholders envisage the objectives being achieved, are then outlined. A goal programming analysis to identify optimal forest use options is briefly described, and findings of the analysis are reconciled with Wik, Balkanu and The Wilderness Society visions of forestry development.

THE SOCIO-ECONOMY OF THE AURUKUN AREA

CYP is a remote and largely undeveloped 13.7 M ha region of far north Queensland. Lying between approximately 11° and 16° S and 141° and 146° E, the Cape has a monsoonal climate with distinct wet summers (with no road access between approximately December and May) and dry winters. The Cape, with a population of only 18,000 people, is renowned for its biological diversity and relative naturalness, its valuable bauxite deposits and also its highly disadvantaged and socially dysfunctional populations of indigenous Australians (CYRAG 1997, Pearson 2000). Traditional Wik land, encompassing the western coastal strip of CYP between Napranum and Pormpuraaw and east to the Great Dividing Range, is an area where these three regional characteristics collide. Aurukun town is the only permanent Wik settlement, home for about 900 indigenous people who account for 88% of the town's population (OESR 2004).

Wik people are seeking native title over about 2.7 M ha of land (Pryor 2000); however, for the purposes of the assessment of Wik forestry opportunities, Balkanu defined a 0.84 M ha study area including all of Aurukun Shire and that part of (bauxite) Mining Lease 7024 in Cook Shire adjacent to the north-west boundary of Aurukun Shire. This area is illustrated in Figure 1 and is hereafter referred to as the 'Aurukun area' or 'study area'. As of 2004, this area comprised land with four tenure and title combinations, namely:

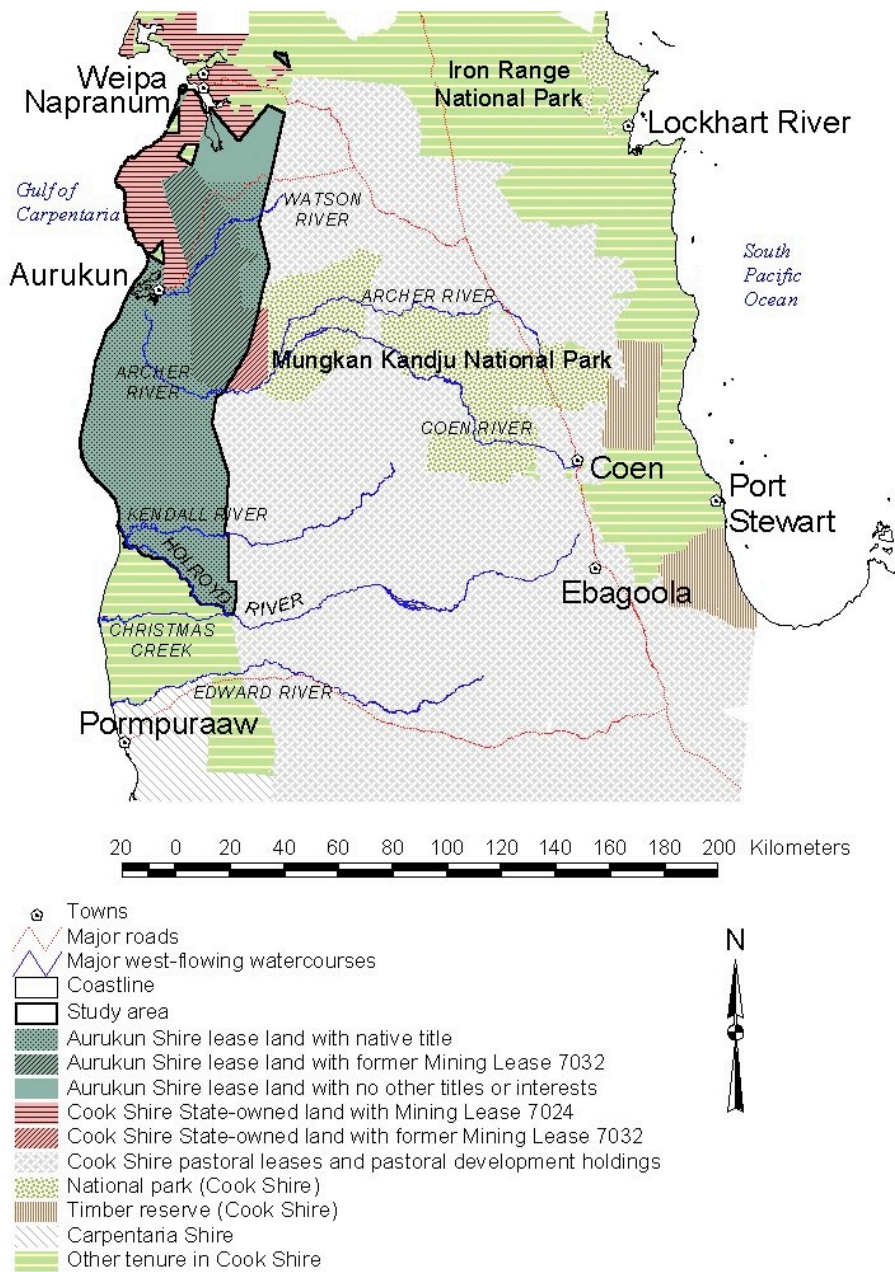


Figure 1. Land tenure on central Cape York Peninsula with the study area highlighted

Source: Generated by the author using ArcView geographic information system software. Spatial data were provided by the Queensland Department of Natural Resources, Mines and Energy in 2000.

1. Aurukun Shire lease land with no other titles or interests (69,900 ha);
2. Aurukun Shire lease land with native title (503,000 ha);
3. Aurukun Shire lease land formerly covered by Mining Lease 7032 and likely to be granted as a new mining lease in the near future (165,200 ha); and
4. unallocated State-owned land in Cook Shire covered by Mining Lease 7024 (103,400 ha).

No mining operations have commenced on either of the mining leases within the study area, although Comalco Pty Ltd, holder of Mining Lease 7024, is presently operating on the part of the mining lease situated north of the study area. Following consistent failure of the company holding Mining Lease 7032 to meet lease obligations, the lease was rescinded by the Queensland Parliament in May 2004. The State government has indicated an intention to call for international expressions of interest in the mining of bauxite deposits within Aurukun Shire (Fraser 2003).

Wik people traditionally lived in a subsistence economy in accordance with complex customary practices and laws. From the late 1800s, encroaching settlers demanded greater control of the 'wild tribes' on CYP, which led to the establishment of Aurukun as a Moravian Christian Missionary settlement in 1904. Depending on whose version of history is subscribed to, indigenous peoples from the 23 separate clan groups who now comprise the Wik population of Aurukun town were either encouraged (McKenzie 1981) or forced (Balkanu c1999a) to move to the Mission. Nevertheless, it was not until the 1970s that the last of the Wik left 'the bush' on a permanent basis (von Sturmer, cited in Dale 1993). The town's indigenous population is a complex of allied and competing clans with several distinct traditional languages, variable status, power and authority (Dale 1993). Inter-clan and inter-racial cultural differences have periodically led to social disorder (Anderson 1981, Leveridge and Lea 1993).

During the Mission era on CYP, indigenous people lived in what Pearson (2000) described as an *institutional modern subsistence economy*, growing their own food, raising cattle and engaging in traditional hunting and gathering. A plethora of resource development projects had been implemented from the earliest days of Mission activity, with the aim of making Aurukun Mission self-sufficient. These included: large-scale poultry farming for local consumption and export; commercial production of corn, maize, pasture seed, cashew nuts and copra; crocodile farming; prawn harvesting; softwood plantation establishment; and dairying and horticulture. Dale (1993) reported that none of these developments were successfully implemented.

Cattle grazing and harvesting and milling of native forest timbers are the only community development projects that were successful over a long time period and appear to have been well-suited to Wik culture. Wik elders recounted to the author some fond memories about their younger days in the 1950s and 1960s harvesting and milling timbers for use at Aurukun and other missionary settlements in north Queensland, including that on Thursday Island. The sawmill reduced the financial drain on the community through limiting the need to import building materials, and generated among Wik people a sense of achievement and pride in supplying goods to other indigenous communities on CYP. Against the wishes of Wik people and the Mission administration, the Queensland Government insisted on supplying Aurukun (and other Queensland indigenous communities) with pre-fabricated European-style wooden houses from the 1960s (Dale 1993). This had a dramatic effect on the demand for locally sawn timber in Aurukun and on CYP generally. By 1970, the Aurukun sawmill had closed

temporarily, marking the beginning of a long series of ‘on-again off-again’ sawmilling activities in Aurukun. Responsibility for local timber production in Aurukun Shire now rests with the Wik Timber Crew, a small number of indigenous people trained in harvesting and basic sawmilling techniques operating under the supervision of a non-indigenous trainer. During fieldwork for this research (2000 to 2002), almost no timber was sawn in Aurukun and the Wik Timber Crew focused on round timber production (i.e. no milling).

Following years of clashes in philosophy between the Uniting Church and the Queensland Government about management of Aurukun Mission, the government took over Aurukun Reserve in 1978. Wik people were then thrust into the market economy. However, cultural differences and low Western education and skill levels excluded them from the *real* economy labour force. A passive welfare economy was created by government where personal sustenance was received without the recipient being required to work or provide anything in return.

Between 1978 and 1990, in excess of \$3 M in funding for economic development projects was provided to Aurukun Shire Council over and above standard Local Council funding (Dale 1993). In 1989, Federal Government agencies supported eight existing and proposed land-use developments in Aurukun Shire, including the outstation movement, a market garden, large-scale cashew and tourism proposals, game meat harvesting, and conservation projects. Dale (1993) concluded that the outcomes of all projects were limited when measured against the objectives of the relevant funding bodies. The Federal Government also funded commercial enterprises in town, including a workshop and bakery in the 1980s, and an arts and crafts centre in the 1990s. Neither of these enterprises generated any medium or long-term benefits for Wik people before closure.

Dale (1993) identified several reasons for the failure of resource development projects in the Aurukun area. These included meagre budgets, ‘practical difficulties’, a lack of technical knowledge to solve agronomic problems and, from the 1960s, State government pressure for economic rationalisation of Aurukun Mission (as a result of which development projects were even less able to tolerate Aboriginal involvement beyond labouring tasks). Failure was especially due to a lack of participatory and technical planning (Dale 1993). Often the Church or Shire Council administration, consultants and non-indigenous project overseers have been the only actors with a serious direct interest in the outcomes of particular projects. Wik support and interest in the projects has generally been limited. No land development projects have been initiated or controlled by Wik people and projects have all failed when the community-based brokers who initiated them became dispirited or departed.

Today, the management and delivery of goods and services to Wik people is undertaken by ‘white fellas’ and Wik people are financially dependent on government welfare, including CDEP. Each week, trucks and barges in the dry and wet seasons respectively, bring goods and services necessary to sustain the urban community, and depart empty because no goods or services are exported from Aurukun. The town lacks economic activities and provides few incentives for children to attend school. A combination of misdirected government policies, low incomes, lack of meaningful employment and low education levels are believed to have contributed to the perpetuation of a cycle of boredom, alcohol consumption² and violence in Aurukun town (Leveridge and Lea 1993, Voss 2000). The life expectancy of indigenous

² As part of a regional plan for CYP aimed at reducing the consumption of alcohol and the associated violence, the number of hours per day that the tavern is open in Aurukun was substantially reduced in 2003.

people on the Cape, including Wik people, is 20 years less than that of other Australians (Pearson 2000). Nevertheless, Wik elders aspire for their people to be economically independent and self-reliant and they would like to achieve this while living on their traditional land (Balkanu c1999b). Wik people and Balkanu have identified timber utilisation on Wik land as one means of achieving the elders' aspiration for economic independence.

THE TIMBER RESOURCE OF THE AURUKUN AREA

The study area is gently undulating and dominated by two major ecosystems, namely Darwin stringybark forests (covering approximately 70% of the Aurukun area) and wetlands. Freshwater and estuarine wetlands extend along the coast south from Aurukun town to the Edward River. Throughout CYP, most soil types are deficient in macro and micro-nutrients, are weakly structured and are erosion-prone following clearing of native vegetation, limiting the land's suitability for intensive agriculture (CYRAG 1997). Cattle carrying capacities for open-range grazing of cattle on native grasses and other native vegetation in the study area average between 21 ha and 56 ha per adult cow equivalent (CYRAG 1997).

The Queensland Department of Primary Industries – Forestry (DPI Forestry) has identified 1.7 M ha of tall Darwin stringybark (*Eucalyptus tetradonta*) forests on CYP outside of National Parks as being of interest for commercial forestry operations. This represents the largest uncut (old growth) timber resource in Queensland with potential to substantially contribute to future timber supplies (Wannan 1995). Timber species of commercial importance in these forests include Darwin stringybark, Melville Island bloodwood (*Corymbia nesophila*) and Cooktown ironwood (*Erythrophleum chlorostachys*). All three species have aesthetically pleasing timber with high density and high natural durability, making them suitable for a wide range of internal and external uses (Bootle 1983, Smith *et al.* 1991, Hopewell 2001, Annandale *et al.* 2002). Nevertheless, the sawntimber requirements of people on CYP are presently transported from sawmills over 2,000 km away in southern Queensland and northern New South Wales.

A two-stage stratified timber inventory conducted by the author in the study area revealed that the standing millable and harvestable (i.e. in accordance with environmental restrictions) log volume per hectare is low for an old-growth eucalypt forest, being typically between 6 m³/ha and 12 m³/ha. The total resource in the Aurukun area is approximately 3.7 M m³ distributed over 0.4 M ha of harvestable forest.

The high-level of interest of Wik people and Balkanu in native forest timber harvesting is partly due to the fact that a large proportion of the commercially valuable Darwin stringybark forest in the Aurukun area grows on deep red kandosols that contain valuable bauxite deposits situated on mining leases. While mining has not yet commenced in these areas, the Queensland Government is attempting to speed up the development of one of the leases (Wilson 2003). Bauxite mining by Comalco Pty. Ltd. in Darwin stringybark forest on a mining lease near Weipa, north of Aurukun Shire, is proceeding at a rate of over 500 ha per annum (Stokes 2000). Currently, Comalco prepares land for open-cut bauxite mining by clearing vegetation with bulldozers and chains, windrowing woody debris and then burning, which represents an enormous waste of a valuable timber resource. Wik people do not have the right to veto mining projects on their traditional land and, since large forest areas will be cleared over time, it seems appropriate that Wik people make best economic use of this timber.

THE CULTURAL AND ECONOMIC SIGNIFICANCE OF DARWIN STRINGYBARK FORESTS FOR CONSERVATIONISTS AND WIK PEOPLE

Historically, Australian indigenous people and conservationists developed formal and informal 'black-green' alliances to assist each other's causes. However, while these groups share some common goals, there also exist large differences in land management objectives. Conservationists are primarily concerned with protecting the natural environment. For Wik people, 'caring for country' is part of a larger agenda, including the gaining of native title over traditional lands, economic development, and securing access to health and education services.

The Wilderness Society, one of Australia's most active national conservation groups, has been undertaking a 'Cape York Campaign', which publicises the conservation significance of CYP. On one of their many web pages dedicated to CYP, The Wilderness Society (2002a) stated:

In far northern Queensland is found one of the world's last great wilderness domains, Cape York Peninsula. Covering an area larger than most European countries, Cape York Peninsula is a veritable 'ark' of rare and threatened plant and animal species and one of the few places on the planet where the mix of rainforests, woodlands, wild rivers, heathlands, forests and wetlands remain intact.

According to Mackey *et al.* (2001), a substantial proportion of CYP, including Darwin stringybark forests, has the potential to qualify for listing under the World Heritage Convention. Conservationists argue that recent assessments of CYP forests (e.g. Wannan 1995, Whisson and Young 1995) have highlighted that Darwin stringybark forests have high fauna habitat value, high wilderness value and high old-growth forest values, but that only a small proportion of these forest types are reserved within the existing National Park estate. The Darwin stringybark forests in the Aurukun area comprise a large proportion of the water catchment for two highly important nature conservation areas that are presently outside of the existing reserve system: the waterfowl habitat surrounding and south of Aurukun town, and the lower Archer River riparian corridor and fringing forests (Whisson and Young 1995).³ The Wilderness Society (2002b, 2003a) has declared that development activities incompatible with maintaining the natural heritage values of CYP, including land clearing for agricultural expansion, construction of large dams and water storage facilities, and commercial logging, should be prohibited on CYP.

Wik people have a historical and spiritual connection with their land that goes back many thousands of years and is difficult for non-indigenous people to comprehend. According to Sutton (1988b, pp 222-23, cited in Martin 1993), for Wik people 'there is no geography without meaning or without history ... The land is already a narrative – an artefact of intellect – before people represent it [e.g. in art]. There is no wilderness.'

It became apparent to the author whilst conducting fieldwork in Aurukun shire that Wik people have a conservation ethic and subscribe to the view that conservation equates with

³ The freshwater and estuarine wetlands of Aurukun Shire have been identified by conservation groups, including the Wildlife Preservation Society of Queensland, as areas that may prove to be equivalent in biological diversity to Kakadu (Smyth 1993). The lower Archer River riparian corridor provides a major bridge between the extensive rainforests of the east coast across CYP to the west coast for rainforest species such as the spotted cuscus (*Phalanger maculatus*), white-tailed rat (*Uromys caudimaculatus*), frugivore birds and the palm cockatoo (*Probosciger aterrimus*).

wise extractive use, whereas Australian conservation groups tend to promote conservation as *preservation* (no extractive use). Wik people have traditionally managed Darwin stringybark forests, with regular burning, to provide many valuable economic and cultural goods and services, including:

- native (and in recent history, exotic) plant and animal foods;
- traditional tools, arts and crafts;
- classrooms for passing on indigenous knowledge to children;
- settings for important Dreamtime stories;
- habitat for clan totem beings; and
- venues for traditional ceremonies.

For Wik people, Darwin stringybark forests are managed landscapes that are important to sustain their people and culture. Western natural resource extraction practices, including selective logging, which can be modified to be culturally appropriate, appear to be generally considered by Wik people as consistent with their cultural management obligations and conservation ethic.

PROPERTY RIGHTS OF WIK PEOPLE TO TIMBER

There is continuing controversy between historians about whether *terra nullius* – the fiction that the land was unoccupied at the time of European settlement – was ever part of law relied on to justify settlement of Australia (e.g. Connor 2004, Pearson 2004). Nevertheless, settlement of Australia proceeded as if the land was *terra nullius* and from the late 1800s, pastoral leases, mining leases, national parks and Aboriginal reserves were imposed over Wik land without consultation with traditional owners. According to Section 45 of the *Forestry Act 1959* (Qld), timber on these land tenure types is the ‘absolute property of the Crown, unless and until the contrary is proved’.

During the Mission era, Church administrators of Aurukun Mission had the right to authorise the harvest and milling of timber in Aurukun Reserve for non-commercial purposes without the need for a harvesting permit from (or payment of royalty to) the Queensland Government. Under the current local government system established by the *Local Government (Aboriginal Lands) Act 1978* (Qld), Wik people and Aurukun Shire Council have similar rights. Before the cancellation of Mining Lease 7032, Wik rights to timber in that part of Aurukun Shire were subject to the condition that they did not interfere with the rights and obligations of the lessee. It is unclear what, if any, limitations would be imposed on the property rights of Wik people to timber by the granting of a new mining lease in Aurukun Shire. Wik people can apply for a commercial harvest license from DPI Forestry in the same manner as any other person or company and would by law be required to pay royalties for harvested timber. Wik people hold no legal rights to timber on Mining Lease 7024; however they could apply for a commercial harvesting permit.

In 1993, the Keating Federal Labor Government passed the *Native Title Act 1993* to address uncertainties arising from the Mabo case and establish a process by which indigenous Australians could obtain native title. In that same year, the Wik people filed a claim in the Federal Court for native title over pastoral leases on traditional land. The Mabo judgement dealt only with unalienated Crown land and most commentators were of the opinion native title had been extinguished by the granting of pastoral leases. The Federal Court decided the

Wik claim could not succeed; however, on appeal to the High Court, the majority ruling was in favour of native title rights coexisting with pastoral leases. Subsequently, the Howard Federal Coalition Government sought to clarify the type of tenure that extinguished native title with the *Native Title Amendment Act 1998*.

No parliamentary *Act* or court ruling has specified exactly what rights to utilise natural resources are conferred by native title. Instead, it has been left for the detail of native title rights to be determined on a case-by-case basis, depending on the local law and custom of each indigenous community claiming native title. In 2000, Wik people were granted native title over Part A of their land claim, 6,000 km² confined to areas that have only ever been unallocated State land or land under forms of title granted for the benefit of Aboriginal people (native title conferred in the study area is illustrated in Figure 1). The judgement granted a form of ‘possessory’ native title, including the right to ‘take, use and enjoy the natural resources [including timber] from the determination area for the purposes of ... disposing of those natural resources and manufactured items, by trade, exchange or gift’ (Federal Court of Australia 2000, Order 3). The judgement established that timber in the Part A determination area is not the absolute property of the Crown. Wik people have been conferred the right to conduct commercial forestry operations without a permit from or payment of royalties to the Queensland Government. Part B of the Wik land claim – land that incorporates seven pastoral leases and four mining titles – is still being negotiated eight years after the High Court judgement⁴.

Regardless of who holds legal rights to timber, various pieces of Federal and State legislation, policy frameworks for the development of CYP and the Queensland *Code of Practice for Native Forest Timber Production* on State-owned land (the Code) have the potential to affect forestry operations⁵. With the exception of the Federal Government *World Heritage Properties Conservation Act 1983*, legislation, policy and the Code affect how forestry operations are conducted in the Aurukun area but cannot prohibit native forest logging.

FORESTRY OBJECTIVES AND OPTIONS FOR THE AURUKUN AREA

Wik people, Balkanu and The Wilderness Society hold contrasting objectives for forestry operations in the study area and visions about how those objectives can be satisfied.

Wik Forestry Objectives and Envisaged Timber Utilisation Options

Insights into Wik forestry objectives have been gained via informal discussions with elders *on country* (i.e. on traditional land outside of urban environments). These discussions confirmed that Wik elders aspire to a forestry industry that will increase their economic independence from government through reducing the level of welfare dependency in Aurukun town, replacing timber imports to CYP with local product, and generating financial surpluses that can be used on other community projects.

⁴ Wik people were granted native title over 12,500 km² of land in Part B of the Wik land claim in October 2004. Negotiation is continuing over the remaining Part B Wik claim area.

⁵ Important Federal and State legislation that can affect forestry operations in Queensland, include the *Export Control Act 1982* (Fed), the *World Heritage Properties Conservation Act 1983* (Fed) and the *Environmental Protection and Biodiversity Conservation Act 1999* (Fed), the *Forestry Act 1959* (Qld), *Timber Utilisation and Marketing Act 1987* (Qld), *Nature Conservation Act 1992* (Qld), *Land Act 1994* (Qld), *Environmental Protection Act 1994* (Qld), *Integrated Planning Act 1997* (Qld) and *Vegetation Management Act 1999* (Qld).

Employment generation is the highest priority objective of elders. They want forestry to provide meaningful, culturally appropriate and adequately-paid jobs for a high proportion of their able-bodied working-age population. Elders believe the provision of meaningful forestry employment and the sale of products to ‘outsiders’ will have many psychological benefits for their people, particularly in raising self-esteem, pride, confidence, and hope for the future. Although generation of any type of employment is considered desirable, employment *on country* is of particular importance because it is considered culturally appropriate, may encourage population decentralisation (and improve social order in town) by providing employment for people at outstations, and may facilitate better connection of young people with *country*⁶. Another Wik forestry objective highlighted by these discussions is to utilise the large volume of timber on mining leases that will otherwise be destroyed. Some Wik people asserted that other economic activities, particularly ecotourism, could take precedence in forest areas outside of mining leases and that some forest in important catchment areas for wetlands should be excluded from logging to preserve waterfowl hunting grounds and the aesthetic appeal of the wetlands for tourists.

Wik people exhibit a diversity of opinion about the structure of a potential timber industry. Many young Wik people were found to be interested in inviting ‘outsiders’ onto their traditional land to harvest and mill timbers on an industrial scale, with Wik people filling supervisory roles (e.g. ensuring important cultural sites are protected) and receiving stumpage payments⁷. Stumpage revenue could be distributed in an appropriate manner among community projects and clan groups, as determined by Wik people. It was asserted that the advantages for Wik people of this type of forestry industry are that income could be received from their forests without the need for a large capital outlay to purchase equipment and develop infrastructure.

An alternative view of forestry activities undertaken by a Wik timber industry has been expressed by the Wik Timber Crew – sawlogs could be harvested and transported to one or several non-Wik sawmills outside the community area. This would take advantage of existing tree felling and snigging skills in the community and require relatively little capital outlay and training. Some elders have heard that a large amount of revenue could be gained by exporting woodchips. A woodchip industry could generate employment in forest management, timber harvesting and woodchip mill operation. In contrast, other Wik elders have envisaged a small-scale timber industry built around clan-based *on country* portable sawmills where each clan would conduct its own forestry enterprise on its own clan estate.

Balkanu Forestry Objectives and Envisaged Timber Utilisation Options

As a community development organisation working for indigenous communities, Balkanu shares the forestry objectives of Wik people; however, they envisage an industry undertaking activities that differ markedly from those proposed by the Wik. Balkanu personnel are promoting the local manufacture of high-value dried, dressed and finished products including strip-flooring and furniture (as opposed to unprocessed logs or roughsawn timber), as the means for best satisfying forestry objectives for the Aurukun area.

⁶ When used by or in the context of Australian indigenous people, the term *country* refers to more than a geographic area. It encompasses all the land, sea, rivers, estuaries and other natural resources, sacred sites, stories, and rights and cultural obligations associated with that geographical area.

⁷ Depending on the location of harvesting operations, stumpage charges may be imposed by the Queensland Government.

The Wilderness Society Forestry Objectives and Envisaged Timber Utilisation Options

In what appears to be a moderation of their opposition to logging on CYP, The Wilderness Society has recently developed a Cape York Peninsula Wild Country proposal that aims to create a 'conservation economy' through 'innovative industrial development' (The Wilderness Society 2004). In this development model, art and cultural products, conservation management, scientific research, biological products, ecotourism and ecologically sustainable forestry industries are encouraged. The details of the Wild Country proposal for CYP are being formulated, but presumably ecologically sustainable forestry would include selective harvesting for portable sawmilling and small-scale value-adding activities including niche market furniture manufacture, but exclude woodchipping. Schneiders (2004) confirmed that indigenous forestry for community development and salvage logging operations on mining leases are increasingly accepted by members of the organisation, but The Wilderness Society continues to discourage the expansion of bauxite mining on CYP and is actively protesting against the Queensland Government plan to develop the bauxite resource in the Aurukun area (The Wilderness Society 2003b).

FEASIBLE AND OPTIMAL TIMBER UTILISATION OPPORTUNITIES FOR WIK PEOPLE

Mindful of Wik, Balkanu and The Wilderness Society forestry objectives and visions, discussions were held with officers in the Horticulture and Forestry Sciences unit of the Queensland Department of Primary Industries and Fisheries (previously the Queensland Forestry Research Institute) to aid the formulation of a wide range of potential forestry activities for Wik people given the timber resource, property rights regime and technological constraints. With current technology, the timbers of the study area were found to be unsuited for the manufacture of paper, reconstituted wood products (e.g. medium density fibreboard, MDF), veneer and plywood (Venn 2004a). Because bioenergy is an infant industry in Australia and appropriate technologies are still being developed (Zorzetto and Chudleigh 1999), it was difficult to assess the feasibility of this technology for the Aurukun area. Six broad feasible forestry opportunities (particular combinations of forestry activities and target markets) that are potentially appropriate for the Aurukun area were identified, namely:

1. sell timber at the stump;
2. sell unprocessed sawlogs, chemically treated electricity poles and other round timber to outside processors and end-users;
3. mill green-off-saw (GOS) boards with portable or fixed-site sawmills;
4. chemically treat and season GOS timber to produce structural and appearance-grade sawnwood (including clearwood for high-value niche markets);
5. drymill treated and seasoned timber into strip-flooring; and
6. manufacture dining suite kits (for assembly at market) from treated and seasoned timber.

Various scales and types of activities have been examined for forestry opportunities 1 to 4, including six alternative sawmilling arrangements. The capital cost of several forestry opportunities considered is high; however, present annual expenditure by government on

CDEP wages in the Aurukun area exceeds A\$4 M⁸ (ATSIC 2000) and this would be reduced if the community became more economically independent. Although there are presently no commercial sawmills within an economic log haulage distance (about 200 km) of Aurukun town, it was considered that the first two forestry opportunities may soon become feasible given the high-level of State Government support for a proposed sawmill in the Weipa-Napranum area. Forestry activities performed *on country*, e.g. harvesting, hauling and portable sawmilling, are only practical during the six-month dry season, whereas timber processing activities located in town can be undertaken year-round.

Data were collected about north Queensland timber markets and Australian native forest timber industry cost and employment structures (Venn 2004a, b). However, it was found that general Australian forestry industry cost and employment structures cannot be transferred directly to a Wik industry. For a timber industry to have a chance of success in Aurukun, employment opportunities need to be designed to accommodate the cultural and social obligations of Wik people⁹, which precludes a 40-hour working week, and recognises labour productivity differences for people with no market economy work experience and limited Western education and skills training. Venn (2004a) described the development of the concepts *culturally appropriate rate of production* and *culturally appropriate full-time equivalent* (CAFTE), which have been used to formulate timber industry cost and employment structures suited to the Wik cultural and economic environment.

A mixed-integer weighted and lexicographic goal programming (GP) model was developed with the General Algebraic Modelling System (GAMS) mathematical programming software package to integrate the substantial quantity of data that had been collected about the Wik timber resource, property rights to timber, potential timber markets, and cost and employment structures of potential enterprises. This model has been used to identify forestry strategies that are ‘optimal’¹⁰ from the private perspective of the Wik population of Aurukun town. Timber utilisation strategies have been modelled over a 30-year planning horizon; however, a single-period rather than a multi-period GP model has been developed, because the latter would have been unworkable¹¹. To facilitate the single-period modelling approach, financial constraints and the performance measure of the income goal were converted into discounted cash-flows with a 7% real discount rate. Cultural and ecological constraints and goals enter the model at constant levels for each of the 30-years of the planning period.

For the purposes of goal programming analysis, the author expressed Wik forestry objectives as five goals, which in decreasing order of importance are to:

1. maximise total employment generation (CAFTEs);
2. maximise employment generation *on country* (CAFTEs);
3. maximise income generation (\$ M in net present value);
4. minimise forest area harvested south of the Archer River (ha/year); and
5. minimise forest area harvested north of the Archer River and outside of mining leases

⁸ US\$1.00 is approximately A\$1.40.

⁹ Wik people are required to fulfill cultural obligations such as social engagements (e.g. participate in mortuary rituals), and traditional management responsibilities within their clan estates (e.g. hunting and fire management). It is sometimes impractical for these activities to be postponed until the end of the working week.

¹⁰ The strict definition of GP is that it is a process of *satisficing*, not optimising. In this paper, the term ‘optimal’ is used in the broad sense, i.e. the optimal solution generated by GAMS.

¹¹ The final version of the GP tableau has 38,244 rows and 34,885 columns with 208,638 non-zero cells.

(ha/year).

It was not possible to elicit Wik preferences regarding tradeoffs between the performance levels of goals. In the absence of precise preference structure information, four preference structures were examined – two of a lexicographic nature that do not permit tradeoffs between goals of different priority order, and two that allow tradeoffs between all goals in accordance with weights that reflect the relative importance of each goal. The GP model was run to generate optimal timber utilisation strategies for six budget constraint levels (ranging from \$0.25 M to \$10 M) and four economic environment scenarios (regarding property rights to timber and markets for timber products).

The GP analysis identified a suite of optimal timber utilisation opportunities for Wik people, as detailed in Venn (2004a). Typical output from the GP model is illustrated in Tables 1 and 2. The tables report goal performance levels and forestry activities, respectively, for the optimal timber utilisation strategies under one of the goal preference structures examined. Employment generation and net present value (NPV) are shown to increase with the budget constraint level in Table 1. Table 2 summarises the forestry activities that are established with the financial capital invested, to generate employment and income. Notably, the tables indicate that high employment and NPV levels can be achieved by fixed-site sawmilling activities milling up to 20,000 m³/year, without harvesting in forest areas outside of mining leases or south of the Archer River.

Table 1. Goal performance levels estimated for optimal timber utilisation strategies under one of the goal preference structures examined with various budget constraints

Goal	Goal performance level by budget constraint				
	\$0.5 M	\$1 M	\$2 M	\$5 M	\$10 M
Maximise total employment generation (CAFTEs)	14.2	16.1	30.1	72.1	108.1
Maximise <i>on country</i> employment generation (CAFTEs)	11.6	13.2	15.2	22.3	36.7
Maximise NPV (\$ M)	2.1	6.1	7.4	15.3	42.8
Minimise forest area harvested south of the Archer River (ha harvested/year)	0	0	0	0	0
Minimise forest area harvested north of the Archer River and outside of mining leases (ha harvested/year).	0	0	0	0	0

In general, across all preference structures and economic environment scenarios examined, the GP analysis reveals that:

- a budget constraint of \$0.25 M is insufficient to establish a successful timber industry in the Aurukun area;
- selling logs at the stump and the harvest and delivery of sawlogs to a non-Wik sawmill are optimal only to the extent possible with underutilised forest management personnel, harvest teams and haulage trucks that are operated to supply Wik timber processing activities;
- almost without exception, portable sawmilling *on country* enters the optimal timber utilisation policy in full (five portable sawmills); and

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