ASSESSMENT OF FOREST DEVELOPMENT OPPORTUNITIES

NSW WESTERN REGIONAL ASSESSMENTS

FINAL REPORT SEPTEMBER 2002

Brigalow Belt South

Stage 2

Resource and Conservation Assessment Council

ASSESSMENT OF FOREST DEVELOPMENT OPPORTUNITIES

NSW WESTERN REGIONAL ASSESSMENTS

BRIGALOW BELT SOUTH BIOREGION (STAGE 2)

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Abbreviations used in this report

ATSIC	Aboriginal and Torres Strait Islander Corporation
BBSB	Brigalow Belt South Bioregion
BBI	Biodiversity Benefits Index
BSS	Biodiversity Significance Score
CDEP	Community Development Employment Projects (ATSIC)
CISP	Cypress Industry Strategic Planning group
CRA	Comprehensive Regional Assessment
CWA	Country Women's Association
ESIF	Environmental Services Investment Fund
FPA	Forest Products Association of NSW
FISAP	Forest Industry Structural Adjustment Program
ICUN	International Union for the Conservation of Nature
HSS	Habitat Services Score
LC	land Council
MCA	Multi Criteria Analysis
MDF	Medium Density Fibreboard
OSB	Orient Strand Board
PEDTC	Pilliga Economic Development and Tourism Committee
RACAC	Resource and Conservation Assessment Committee
RACD	Resource and Conservation Division of Planning NSW
RFA	Regional Forestry Agreement
SFNSW	State Forests of NSW
WRA	Western Regional Assessment

PROJECT SUMMARY

This report describes a project undertaken for the Resource and Conservation Assessment Council as part of the regional assessments of western New South Wales. The Resource and Conservation Assessment Council advises the State Government on broad-based land use planning and allocation issues. An essential process for the Western Regional Assessments is to identify gaps in data information and the best ways in which to proceed with data gathering and evaluation.

Project objective

The objective of this project was to provide decision makers and the community with information on forest based industry development opportunities.

Methods

The study included both desk based research and consultation with industry and community members.

Key results and products

Priority forest based industry development opportunities include:

- Oil and gas industry exploration and development
- A lamination plant to add value to lower grade cypress timbers
- Supplementary thinning of cypress regrowth as per the *Friends of the Pilliga* proposal
- Harvesting and processing of the ironbark resource previously believed to be "sub-economic"
- Firewood harvesting from greenwood thinnings and under utilised species
- Apiary growth linked to market demand and continued access to BBSB sites
- The Pilliga Cultural Heritage Centre

Multi-criteria analysis of economic opportunities for the Aboriginal community of the bioregion resulted in the Pilliga Cultural Heritage Centre receiving a priority recommendation. The cultural heritage centre has the potential to act as a catalyst for a range of other economic opportunities for indigenous people (cultural heritage tourism, arts and craft of the region, bushfoods, Aboriginal studies and so on). Other distinct opportunities for Aboriginal people include commercial apiary, intellectual property management and public sector employment.

1. INTRODUCTION

1.1 PURPOSE OF THE STUDY

The purpose of this study was to provide an analysis of potential forest industry development opportunities with a focus on existing and potential forested land use strategies for the Brigalow Belt South Bioregion (BBSB).

The objectives of the project were to:

- Identify potential development/expansion opportunities for existing and/or new significant regional forest related industries/activities; and
- Identify opportunities for synergies between existing industries/activities.

At the request of RACD the study was expanded to include explicit consideration of Aboriginal community development and oil and gas based opportunities.

1.2 METHODOLOGY

The study included a literature review, incorporation of the outputs of other Western Regional Assessment (WRA) studies, consultation, workshops, analysis of opportunities and report preparation.

The study was completed between January and September 2002.

The study focused on forest based industries and did not include the broader spectrum of industry within the bioregion, for example no consideration was given to horticulture or aquaculture as these industries are not directly linked to the region's forest resource.

Interaction with the BBSB community in identifying and assessing opportunities included:

- A survey of mill owners to identify opportunities for timber industry development 20 – 22 March 2002;
- A workshop with Aboriginal stakeholders at Baradine to identify opportunities for Aboriginal employment – Pilliga Forest Aboriginal Management Committee, 20 March 2002;
- Western Regional Assessment Stakeholder Workshop - presentation and workshop to identify and refine economic development opportunities, 21-22 April 2002;
- A Cypress Industry Strategic Planning Workshop that included representatives from regional mills and State Forests NSW, 23 April 2002;
- A presentation and workshop at the Western Regional Assessment Aboriginal Information Day, Narrabri, 7 May 2002; and
- A workshop to rank forest industry development opportunities and explore synergies, 19 June 2002.

Opportunities were developed after review of previous investigations (see for example The Proteus Management Group 1999 and The Stage One BBSB Socio-Economic profiling 1999) and consultation with stakeholders including members of existing forest based industries. Opportunities sourced from the literature and collected from stakeholders were assessed using multi-criteria analysis. Criteria included resource availability, markets, employment created, capacity to attract investors, appropriate support infrastructure, scale of impacts, skills available, community/government support, government assistance required and capacity to create opportunities for the Aboriginal community.

1.3 STRUCTURE OF THE REPORT

The report is structured around the reference term of forest industry development options.

Chapter 2 defines existing BBSB forest based products and provides a review of existing market conditions and trends. Chapter 3 lists significant forest industry development opportunities and provides a brief overview of each opportunity. Chapter 4 highlights specific development opportunities related to the BBSB Aboriginal community. Chapter 5 explores oil and gas related opportunities. Forest industry development opportunities are ranked in Chapter 6. Synergies between opportunities and existing industries are also developed in this chapter. Study conclusions are developed in Chapter 7.

2. MARKET CONDITIONS AND TRENDS BBSB FOREST PRODUCTS

2.1 INTRODUCTION

This chapter provides a summary, in table format, of the economic profile of major forest based industries in the bioregion. Major products, market conditions and trends are reviewed and an overview of economic conditions provided.

The overview of economic conditions is derived from work completed by the CARE as part of WRA28 and presented at a stakeholder meeting in April 2002.

2.2 OVERVIEW OF ECONOMIC AND SOCIAL CONDITIONS IN THE REGION

While the economic and social picture at the regional scale may appear to be reasonably robust it needs to be remembered that the relatively prosperous and growing Dubbo urban area dominates regional statistics. Other areas within the region, typically the smaller towns and rural areas are in a state of economic decline. These areas are characterised by diminishing social infrastructure and services and on current indications few opportunities for new developments and employment.

Local communities in rural areas within the BBSB appear to be vulnerable to adverse economic change. The current boost in rural incomes delivered by a low Australian dollar cannot be guaranteed to last, given the prospect of a rise in the value of the dollar and an expectation of the *El Nino* effect. Agricultural production drives economic performance in the region.

Key economic statistics and indicators include:

- The economy of the region is characterised by a high dependence on primary production, particularly broad acre agriculture (grains, sheep, beef).
- Public forests and related industries comprise less than 1% of the assessment region's economic activity, however, these industries are extremely important locally, being a major employer in six towns in the region – Baradine, Gulargambone, Clarence, Gwabegar, Narromine and Narrabri.
- Coonabarabran has the highest percentage of forest industry employees.

- Community sensitivity analysis shows that some social catchments (including smaller communities within) are potentially sensitive to change in forest use.
- Average income in the bioregion is 70% of state average.
- Only in Dubbo and Narrabri is there more tax collected than social welfare payments made. In Gunnedah and Quirindi receipts equal payments. In all other centres welfare payments exceed tax collection.

2.3 MAJOR PRODUCTS, MARKETS AND TRENDS

A summary of major forest industry products, markets and trends in provided in the table below. Data was sourced from the Stage 1 report (RACD, CARE, EBC, 2000) and subsequent stakeholder consultation.

Overview statistics of relevance include:

- There are approximately 565,000 ha of State Forest and 132,000 ha of NPWS managed land in the assessment region.
- The native timber industry utilises two main species types, cypress and ironbark.
- Public forest yield is approximately 80,000 tonnes per annum made up of 60,000 in cypress, 10,000 in hardwood and 10,000 in firewood.
- The current sustainable yield of cypress is fully committed to existing customers under existing sales arrangements.
- Annual quota allocations in the cypress and hardwood industry have operated for over 70 years.
- Forest management activities are of a lower intensity than the coastal forests given the lower rainfall and slower growth rates of trees in the western region.

TABLE 2A: MAJOR FOREST INDUSTRY PRODUCTS, MARKETS AND TRENDS

CYPRESS TIMBER PRODUCTION	The cypress industry mills timber from public and private land to produce green saw and kiln dried value added products. Primary products harvested from forested lands include sawlog, vine post, fencing and firewood. Subsequent sawlog products include flooring, fencing, palings, decking, paneling, pickets, weatherboards and green sawn framing. Products may be dressed, seasoned or unseasoned depending on application.
Gross value and volume	In 1995 gross value ex mill was $20 million, in 2002 this has grown to around $30 million. Total SFNSW commitment to the industry of High Quality Large and Small cypress was 62,830m^3 in 1999. This includes 58,350m^3 sawlog, 2,200m^3 vine posts and 200m^3 miscellaneous.
Domestic Vs export markets	Historically market destination has been: 46% Sydney, 14% Melbourne, 1% Brisbane, 37% Country NSW and 2% export (SFNSW 1995). There is strong demand for cypress framing and weatherboards west of the Great Divide where the wood's inherent termite resistance is highly valued (RACAC 2000). Since 1995 there has been a strong growth in high value exports to Japan, the USA and South East Asia and these markets hold the potential to absorb the entire industry output over the next few years. At the present time $6 million in gross value is exported and this could reach $30 million in the next few years (pers. Comm. Russ Ainley FPA). Current exports equate to approximately 15% of production by volume (SFNSW estimate). The NSW industry has focussed on Japan while the Queensland industry has developed markets in the USA.
Number of operations	Nine fixed mills inside the region and one outside the region plus five mobile mills and a single private property operation (RACAC 2000).
People employed	174 people directly employed in the industry in the region (RACAC 2000). Additional employment is generated through contract harvesting and haulage and in smaller mobile mills. The industry makes a considerable contribution to the viability of local economies and communities.
Competition	Historically competed against radiata and slash pine, hardwood, steel and concrete in the framing and sub-flooring markets on price alone. Increasingly positioned on unique product attributes (pest resistance, durability, appearance) in domestic and export markets. The NSW cypress industry was the first building material supplier to achieve accreditation with current Japanese building regulations.
Price	Historical price at mill door: average log price of $32.60 /$m^3$ plus costs for fall, snig and haulage. Total average mill door log value is therefore $61.08 (State Forests 1996). Historical average selling price to merchants (1994/95) ranged from $390 (scantling) to $510 (flooring) to $550 (weatherboard) per m^3. Historically sold in opposition to other species on price (State Forests 1996). This has now changed – sale now includes innate qualities of the resource. Mills obtain better recovery from framing, bearers and joists. High value products include flooring and panelling.
Price trend	ABARE (2000) statistics the price of hardwood (structural timber) has increased from 1989-90 (base year) to 1998/99 by 26.8%. Prices of softwood have increased by 33% for the same period. Growth in exports since the mid 1990s are against a backdrop of a depreciated Australian dollar.
Product trend	Industry has moved towards greater value adding and now produces approximately 60% of its sawn output as kiln dried value added eg flooring and panelling (RACAC 2000). There is increasing demand for cypress flooring. Since 1995, all but one of the mills taking timber from the region have undergone equipment upgrade for the purpose of value adding. Against this highly successful background there remains further scope for additional value

	adding, new products and co-product use (pers. comm. SFNSW and CISP). Key products directed to Japan are dodai (5 inch square sub flooring structural timbers), floor boards and a small amount of framing (most framing exports originate from Queensland).
Outlook	Domestic: dependent on building industry; business and consumer confidence. Export: domestic building industry conditions in Japan and USA, market access and exchange rate movements.
Distribution and promotion	Most Cypress sawmills carry out their own harvesting and log haulage using own equipment. Mills generally supply local markets direct. The chain involves State Forests selling to Sawmills who sell to agents, merchants or builders who may sell to one another or direct to consumers. Agents and wholesalers are a critical part of supply chain for metropolitan markets (State Forests 1996). Industry has developed cooperative marketing arrangements whereby more than one mill will work together to fill specific customer orders (pers, comm. CISP)
In summary	• Industry has delivered on its 1996 Strategic Plan and shifted market position from a low cost, poor quality alternative on the domestic market to a higher unit priced and quality assured product that includes significant exports. • Since 1996 mills have invested in value adding including kin drying and the development of higher value products such as flooring and panelling. • Significant further export opportunities exist. • Wood supply certainty and quality limit growth • Further processing possible • By-product opportunities

HARDWOOD AND OTHER NATIVE TIMBER PRODUCTS	Hardwood and other native timber products include sawlog, firewood, didgeridoo and fencing products. The major commercial hardwood species is ironbark and a single fixed mill processes sawlog into electric fence droppers. Five mobile mills cut predominantly ironbark for fencing, landscape supplies, bridge girders, and green saw markets in regional and metropolitan areas (RACAC 2000). Railway sleeper cutting, once an important regional industry, ceased operation in any scale in the mid 1990s. Most hardwood is sourced from State Forests. Other species with commercial potential include bulloak and black cypress.
Gross value and volume	Industry gross value is small and is estimated at something less than $1 million per annum. Total SFNSW commitment of hardwood timber was 10,810m^3 in 1999. This includes 9,150 m^3 in Large and Small sawlogs, most of which was committed to the mill producing electric fence droppers in Baradine, 210m^3 was provided for didgeridoo timber and 1,450m^3 for fencing. In addition to sawlog commitments SFNSW also provide a commitment for firewood. In 1999 this amounted to 10,250 tonnes of hardwood. Gross value of firewood sales was estimated at $56,000 (RACAC 2000).
Domestic Vs export markets	Most hardwood harvested in the region is destined for domestic markets. A limited amount meets landscaping, bridge girder, and electricity pole cross-arm needs. Some of the timber processed into electric fence droppers is exported. Firewood timber is consumed in metropolitan centres including Dubbo and the Blue Mountains.
Number of operations	One fixed mill within the region, and up to five mobile operations. The mobile mills are small and add little value to the timber before on-selling the wood to local buyers (RACAC 2000). Domestic firewood collection (particularly in the Goonoo State Forest at Dubbo) is a major activity for local communities. Annually SFNSW issues 1200 permits to local people for cutting domestic firewood, in addition to 14 commercial firewood permits (RACAC 2000).
People employed	Fixed mill employs twenty-four people and has five contractors; mobiles employ fourteen full time people (RACAC 2000).
Competition	The two largest volume markets are firewood and electric fence droppers. The firewood market would compete against suppliers in other regions with access to a hardwood resource. The industry is also under threat from changes to legislation aimed at protecting habitat and EPA concerns about pollutants from combustion heaters in metropolitan areas. Hardwood electric fence droppers face competition from manufactured plastics and steel with insulators.
Price and price trend	No data available from the Stage 1 report. ABARE (2000) statistics indicate that the price of structural hardwood timber has increased some 26.8% over the last 10 years.
Product trend	Historically important supplier of railway sleepers. Potential for new products such as floor boards from a maturing ironbark resource.
Outlook	Dependent on maturing ironbark resource for growth in mill products and government policy on dead wood collection in light of habitat protection initiatives.
In summary	• Ironbark milling confined to a single Baradine operation. • Ironbark milling has been important in the past (sleeper cutting) and may be in the future (new resource coming on line). • Firewood is important both commercially and for domestic collectors • Firewood industry may be restricted by changes in legislation. New opportunities may exist for utilisation of “green firewood” sourced from thinnings and commercial harvest waste.

APIARY	The main products produced in the area are honey and packaged bees for sale both domestically and overseas. Other products include bees' wax and queen bees bred to establish new hives. (RACAC 2000).
Gross Value and volume	Gross wholesale value is $10 million for honey and wax produced in the State Forests and National Parks in the Pilliga and Goonoo Forests (RACAC 2000). Packaged bee sales have grown dramatically over the last few years and two major operators gross around $3 million per annum. Gross value of honey and wax does not include income earned from 160 sites on RLBP managed land. Nor does if include income earned from pollination services or the value of the BBSB as an overwintering destination.
Domestic Vs export markets	Some exports of honey. Packaged bee sales are dominated by exports and include countries such as Korea, Canada, France and the Middle East (RACAC 2000).
Number of operations	In 1999, SFNSW issued permits to 223 separate apiarists in the BBSB, allowing beekeeping activities on 750 sites. A permit allows the permit holder access to a 1.61km^2 site and costs $77 per permit per annum. In 1999, NPWS issued 50 apiary permits in the BBSB with an annual cost of $50, each permit covered an average 2km^2 (RACAC 2000). In addition there were 160 sites covered by apiary permits on RLPB managed lands. It was not possible to estimate the number of individual permit holders. Average size of approx 1.5km^2. Value of production on these sites not estimated in RACAC (2000). Further, RACAC (2000) did not estimate the number of apiary sites on private land or utilising private land adjacent to National Park or State Forest.
People employed	No estimate of employment was provided in the Stage 1 assessment. However an approximate could be estimated assuming 223 separate single operations in State Forests plus 50 in National Parks, a total of 273 persons.
Competition	Honey competes with product from other regions but has potential for differentiation on a certified "chemical free" basis.
Price	In 1999, honey produced in the South Brigalow region had a wholesale value of approximately $1.80/kg. (RACAC 2000). Honey is a high value product, particularly at present due to a bad season and recent loss of floral resource to bush fires. Capillano recently paid $2.81/kilo up from $1.80/kg last year (Greg Roberts, pers. comm. 17/04/02). In 1999, the wholesale value of wax from the region was approximately $5/kilogram (RACAC 2000).
Outlook	Honey production is influenced by external factors such as weather patterns, with years of greater than average rainfall promoting optimal honey conditions in terms of quality and quantity (RACAC 2000). Also influenced by flowering cycle and dependence on the region's numerous eucalypt species. NSW wide the industry is being constrained by lack of access to and destruction of floral resource. Urban encroachment on the coast and agricultural spray drift are disruptive to the industry. A large and florally abundant area like the Pilliga and Goonoo are essential for industry outlook.
In summary	• Major regional industry • Has new products (packaged bees) and export markets • Resource access critical for industry viability and growth.

GRAZING IN FORESTS	RACAC estimated that State Forest grazing permits for cattle and sheep have a potential annual gross value of between $49,000 and $79,000 per annum and provide part time employment for up to 10 people in the region. Approximately 38,000 ha of the assessment area is utilised under permits (RACAC 2000).
Gross Value	Potential annual gross value of grazing on State Forest grazing permit areas for cattle is between $7,114 and $10,670 and for sheep is between $42,682 and $64,022 (RACAC 2000). Total value of forest permits to State Forests was $12,000 in 1999 (RACAC 2000).
Number of operations	In 1999, State Forests issued 33 grazing permits to 30 separate graziers in the Region. Permit sizes ranged up to 5,000 ha, with the majority of permit sites falling into the 1,000-2,000 ha category (RACAC 2000). In 1999, the average cost of a grazing permit was $360, with the costs ranging between $110 and $1,380 (RACAC 2000). The total area of land utilised for grazing (along with other uses) on State Forests in the Region is approx 38,000 hectares or 7% of the total State Forests in the region. 60% is suitable for sheep and 40% for cattle (RACAC 2000). The carrying capacity for cattle is 1 Dry Beast Equiv per 20 ha per annum for sheep it is 1 DSE per 5 hectares per annum (RACAC 2000).
People employed	Employment estimates relate to actual employment on particular grazing sites and no attempt was made to translate to FTE. 7-10 people maximum throughout the year. Employment is not continuous (RACAC 2000).
Outlook	In general a significant rainfall event encourages the increased utilisation of State Forest areas for grazing.
In summary	• Value of grazing industry products generated from BBSB permits is minor. However, access to forest grazing can play a strategically import role in farm management. Grazing leases supplement private property resource especially during droughts.

TOURISM AND RECREATION	The LGAs of the South Brigalow region fall into two tourism regions defined by Tourism NSW: Orana (Coolah, Coonabarabran, Dubbo and Gilgandra) and the New England Region (Gunnedah, Narrabri and Quirindi). Merriwa LGA is in the Hunter region for tourism purposes (RACAC 2000). It is estimated that nature based tourism and recreation, based around natural features of interest, walking tracks and National Parks is the main reason for visiting rural areas in NSW (Stage 1 – Attractions Development Strategy 1999). Attractions are diverse across the region and include the Warrumbungle Aboriginal Site Tour, Siding Springs Observatory, Gilgandra Flora Reserve and Mount Kaputar National Park.
Gross Value	Stage 1 estimated that there were approximately 1,252,000 visits to the region in 1996/97 (Tourism NSW Visitor Database 1996/97). Visitor expenditure in 1996/97 in the South Brigalow Region totalled $200 million (Tourism NSW 2000). In 1998/99 there were approximately 66,250 visits to national parks in the BBSB and 15,000 to State Forests (RACAC 2000).
Value share domestic/export	International visitors are expected to continue to increase however the majority of visitors originate from Sydney (78% in 1997) (Attractions Development Strategy, 1999).
Number of operations/average size	• The majority of operations are small, with the exception of a few large attractions such as the Dubbo Western Plains Zoo. • There were 46 attractions registered with Tourism NSW under the Visnet database in 1999 (Tourism NSW 1999).
People employed	No estimate provided in Stage 1.
Price	• Pricing and advertising arrangements of the attractions vary considerably between location and activity type. • In broader studies, it has been estimated that one third of rural attractions attract no admission fee (Stage 1).
Outlook	The majority of visitors to the region are domestic visitors. Half the visitors to regional attractions are local residents. Visitation for NSW is expected to continue to increase (Stage 1 – Attractions Development Strategy 1999).
Distribution and promotion	• Dubbo has the largest visitation and Coolah the least • Around half rely on word of mouth as the primary means of publicising their operations (Stage 1).
In summary	• Visitors make a significant contribution to the BBSB economy (1.2 million visits valued at $200 million in 1996/97). • Forest visitation is 15,000 per annum.

Source: Stage One Economic and Social Assessment for the BBSB and supplementary research

3. DESCRIPTION AND EVALUATION OF FOREST RELATED DEVELOPMENT OPPORTUNITIES

3.1 INTRODUCTION

Opportunities for expansion of significant existing or new forest based industries are identified and reviewed in this chapter. Opportunities are assessed on a sector basis consistent with the review of products, markets and trends completed in Chapter 3, i.e.

a. Cypress timber production;
b. Hardwood and other native timber products;
c. Plantations, woodlots and agro-forestry;
d. Apiary products
e. Grazing; and
f. Tourism and recreation – forest based.
g. Gas and mining

A Multi-Criteria Analysis was completed for each opportunity identified and criteria are as outlined in Chapter 1. A brief description of the opportunity and a conclusion following assessment is also provided.

3.2 CYPRESS TIMBER PRODUCTS

Opportunities for expansion of existing and new cypress based products were identified as:

- Further processing of timber
  - Increase the percentage of product that is dried and dressed
  - Introduce finger joints and laminating capacity, laminate with ironbark
  - Microwave technology
- Maximising alternative export markets
  - Follow the Queensland cypress industry into the USA market

- Co-product utilisation
  - Cypress oil for improving pest resistance and strength of structural timber
  - Briquette manufacturing from mill waste after oil is extracted
  - Co-generation of electricity from mill by-products
  - Use of by-products in MDF or OSB production
- Supplementary cypress thinning
- Silviculture with utilisation of thinnings
  - Silviculture to ensure future premium timber supply
  - Cypress poles for organic wine industry trellising
  - Firewood

Each of these opportunities for the BBSB cypress industry is detailed below.

Further Processing of Cypress Timber

Since the formulation of the NSW Cypress Industry Strategic Plan (SFNSW, 1996) the industry has made rapid progress in the creation and marketing of high value products. Most mills have invested in kiln drying and/or dressing equipment. The nature of the market for cypress timber is such that additional value may be generated from further investment in plant and equipment. At the current time the industry has difficulties in supplying market requirements with current variable/poor quality resource. Laminating and finger joints are one way of overcoming this variability. Manufactured products of consistent quality could be developed from lower value resource and by-products. This option may involve:

- Increasing the percentage of product that is dried and dressed;
- Introducing finger joints (for length) and laminating (large end sections) capacity;
- Incorporating ironbark in laminates to increase the strength of structural timber; and
- Microwave technology.

TABLE 3A FURTHER PROCESSING OF CYPRESS TIMBER

Resource availability	• The opportunity is substantially reliant on further processing of existing resource rather than harvesting additional cypress. The region's cypress resource is at maximum sustainable yield. • Current industry investment is on hold until resource security assured and WRA process complete. • Japanese market wants certainty of supply and 10 year contracts. They do not want to specify cypress in their building codes and then not have it supplied.
Markets	• Stable domestic base and growing export markets. • Japanese market requires earthquake and pest resistant timber, especially 5-inch square "doadi" that is difficult to supply without laminating and finger joints. Product also used in ornamental Japanese bridges. • Top line products sell themselves, finger joints and laminates are an obvious way to increase the value of second grade material • Watch litigation potential of structural timbers.
Employment created	• Incremental direct employment.
Capacity to attract investors	• Commercial opportunity with resolution of current uncertainty

	regarding resource security. • Small scale laminating plant costs in the order of $0.5 million
Scale of impact	• Laminating and finger joint investment could be viable for a single plant in the region or on a cooperative basis. A single laminating plant is thought to be viable. • Adding ironbark to the outside laminates would add structural strength. • Microwave technology is promising but too experimental at the current time for commercial implementation. Microwaving assists with timber drying, reintroduction of oils (not an issue for cypress), produces a rubbery wood for bending that can be filled with resin and moulded.
Skills available	• Yes, overseas study tours undertaken by CISP members, partnering with New Zealand laminating/gluing specialists plus an active R&D program supporting this area. Major improvement in gluing technology in the last few years.
Appropriate support infrastructure	• Supply (SFNSW plus private resource cypress) and distribution (transport, agents, merchants, export links) already established.
Capacity to create opportunity for the Aboriginal Community	• Existing Aboriginal employment in mills. • Opportunity for Aboriginal ownership of mills explored separately in Chapter 6.
Community/Government support	• Reviewed in Community Stakeholder Workshop (Coonabarabran April 2002) without adverse comment. • Consistent with NSW government policy to add value to natural resource harvest.
Government assistance required	• Assurance of resource security. • Additional silviculture and regrowth thinning to support growth of stands suitable for milling (also supported by local conservation interests). • CISP interested in resource security rather than FISAP investment. Industry went through structural adjustment in the mid 1990s.

The opportunity to further process cypress timber through additional drying and dressing, finger joints and lamination is a logical progression from the industries current strategic plan. Microwaving is not a commercial proposition at this stage. Further processing provides the opportunity for the industry to supply precise Japanese product specifications on a consistent basis (i.e. accurate dimensioning of specific componentary). Business plans are currently being formulated to realise this opportunity and investment is awaiting the outcome of the BBSB Assessment.

Maximising Alternative Export Markets

A further opportunity exists for the NSW cypress industry, based in the BBSB, to export product to the USA. The Queensland cypress industry has been very successful in exporting flooring and cladding to the USA. Only a small proportion of NSW production is currently exported to the USA and Queensland industry success provides a potential conduit for NSW product. Joint service of both markets may increase individual mill specialisation and help meet large specific export orders. It is understood that the US and Japanese markets require different products.

TABLE 3B FOLLOW THE QUEENSLAND INDUSTRY INTO THE USA MARKET

Resource availability	• Reliant on further processing and redirecting of existing resource, may need to draw product from the domestic market.
Markets	• Large USA market and limited supply from Queensland. • Product is floorboards and cladding, which may complement Japanese requirements for structural timbers.

	• Risk lies in size of USA market – Weyerhauser minimum order is 20 container loads. Could be a distraction from domestic opportunities. Japanese market still has plenty of growth.
Employment created	• Incremental direct employment to the extent that additional dressing is required.
Capacity to attract investors	• Commercial opportunity with resolution of current uncertainty regarding resource security.
Scale of impact	• Capacity to add to drying and dressing, laminating and finger joint investment outlined above.
Skills available	• Yes, some BBSB mills currently supplying this market.
Appropriate support infrastructure	• Yes. Cooperative arrangements with the Queensland industry would be advantageous.
Capacity to create opportunity for the Aboriginal Community	• As per further processing above.
Community/Government support	• As above.
Government assistance required	• Assurance of resource security. • Additional silviculture and regrowth thinning to support growth of stands suitable for milling (also supported by local conservation interests). • CISP interested in resource security rather than FISAP investment. Industry went through structural adjustment in the mid 1990s.

Further exploration and development of the USA market would be an ideal objective of a second industry strategic plan. The opportunity is complementary to further investment in cypress timber processing. The American market also requires an accurately milled and highly consistent product. The downside of the opportunity is that it may divert resource and attention from maximising opportunities in the established and growing Japanese market. If improperly managed it may also create price competition with Queensland. The opportunity should be pursued with caution.

Co-Product Utilisation - Cypress Oil

Cypress oil is an emerging product believed to have market potential as a natural alternative to chemical treatment of timber for pest resistance. The oil to applied to timber (eg radiata pine[1] or the sap wood of cypress which is not termite resistant) to add pest resistance and strength. Cypress oil is extracted from sawdust and mill waste using steam distillation. The product may also have potential as a natural insect control on livestock and as an anti-fouling agent on boats. Small volume sales for use in treating timber have created considerable market interest in Japan and the USA. The industry has funded R&D to further the products development. The opportunity in the BBSB would be to utilise R&D findings to ramp up production to a commercial scale.

TABLE 3C CO-PRODUCT UTILISATION - CYPRESS OIL

Resource availability	• Oil distillation uses current industry waste.
Markets	• Market is as yet unproven. • Banning of chemical pesticides together with concerns for environmental and human health create market opportunities for natural pest management products.

[1] Concern was raised at 19 June workshop that giving radiata pine cypress properties or termite resistance would create a new competitor. Volumes of oil available would seem to rule this out.

	• New Japanese building regulations mean that pest treatment must be non-chemical. • Opportunities would be domestic, Japan and USA as well as other western countries with interest in non-chemical pest control.
Employment created	• Incremental, if plants are added on to existing mills. May employ a single additional person at each mill.
Capacity to attract investors	• Commercial opportunity to add new income stream to existing regional mill businesses.
Scale of impact	• Small to medium scale impact on employment • Potential to use waste after oil is extracted for compressing into firewood briquettes.
Skills available	• Yes, trail commercial operation has been established in NSW, R&D program outputs available for implementation.
Appropriate support infrastructure	• Supply of raw material (mill waste) established and trials in export markets reported favourably.
Capacity to create opportunity for the Aboriginal Community	• Minor.
Community/Government support	• Likely
Government assistance required	• Unlikely, maybe assistance with commercialisation through FISAP. Most important thing is resource security assurance.

Cypress oil production would seem to hold considerable potential for utilisation of what is currently a waste or low value by-product. In scale the opportunity is secondary to the further processing of cypress timber. It is an opportunity for a new forest based product in the BBSB that should be pursued.

Co-Product Utilisation – Briquette Manufacture from Mill Waste

Extraction of oil from cypress sawdust leaves a wood pulp waste that could be manufactured into a briquette for sale as a heating fuel. Mill waste could be used in briquette production either with or without first extracting the oil. Briquette manufacture could also utilise thinnings from State Forest operations and waste from hardwood harvest. A briquette plant was established in the Eden RFA and product is retailed through Kmart in Melbourne. Briquettes are manufactured in simple hydraulic presses and chemical bonds are created without the addition of glue.

TABLE 3D CO-PRODUCT UTILISATION - BRIQUETTE MANUFACTURE

Resource availability	• Briquette manufacture uses current industry waste. • Plant could also utilise grain waste. • A thorough investigation of volumes required for a commercial operation would be required as part of a comprehensive feasibility/business plan investigation. It is unlikely that the region could support more than a single plant.
Markets	• Market found for Eden briquette plant output in Melbourne. • Potential market might be Dubbo and/or the Blue Mountains.

	• Would need to be priced to complete with conventionally harvested firewood. Conventionally harvest firewood is under pressure from threatened species/habitat protection legislation and briquettes may be an alternative sustainable supply. • Product is understood to burn cleaner than conventional firewood. • Product may be suitable for use as a power plant fuel or in large institutions like hospitals with furnace based heating.
Employment created	• Medium, a single plant would generate additional local employment.
Capacity to attract investors	• Opportunity would appear to be commercial. Method of establishing the Eden plant should be reviewed.
Scale of impact	• Medium impact from a single plant.
Skills available	• Some training may be required but process is a simple one that should be able to use existing labour and management resources in the bioregion.
Appropriate support infrastructure	• Supply of material from mills plus SFNSW. • May be possible to utilise conventional firewood harvester markets and distribution networks.
Capacity to create opportunity for the Aboriginal Community	• Potential for a stand alone business that might be created with some form of grant money or Aboriginal investment funds. • The opportunity might utilise CDEP labour.
Community/Government support	• Likely in the short to medium term. In the longer term environment protection authorities seek to phase out solid fuel combustion heaters in metropolitan areas.
Government assistance required	• Possible assistance with grants funding.

A briquette plant producing an alternative to conventionally harvested firewood would make a small but positive contribution to forest based economic activity in the Bioregion.

Co-generation of electricity from forestry by-products

An alternative to the production of briquettes from forestry waste is their combustion for co-generation of electricity. Electricity from renewable sources can be marketed as “green-power” and electricity generators have a requirement to source a percentage of their energy needs from renewable sources. A number of large and medium sized mills in NSW are negotiating contracts for the supply of forestry waste to NSW power generators (RACAC 2000). Currently some cypress waste from the BBSB goes to Lidell Power Station. On the NSW coast there are dedicated wood fired electricity generation plants. In the BBSB there is insufficient resource for a dedicated wood fired plant. Potentially there is sufficient resource for co-generation where forest waste would provide part of a plants energy needs. Previous investigations into the feasibility of utilising BBSB forest waste for co-generation have been hamstrung by the cost of transporting waste to a generation facility. A variation on this option is a “gasifier” that uses mill waste to create power for the mills own needs.

TABLE 3E CO-GENERATION OF ELECTRICITY FROM FORESTRY BY-PRODUCTS

Criteria	Co-generation of electricity from forestry by-products
Resource availability	• Marginal, a thorough investigation of volumes required for a commercial operation would be required as part of a comprehensive feasibility/business plan investigation. It is unlikely that the region could support a stand-alone plant.
Markets	• A co-generation facility would supply power into the national grid.
Employment created	• Medium impact on employment.
Capacity to attract investors	• Project may have appeal to SEDA, the sustainable energy development authority or one of the existing power generators. It is unlikely to be a project that could be established from scratch by local interests.
Scale of impact	• Medium, a single plant would generate additional local employment.
Skills available	• It is likely that skills would need to be imported into the Bioregion.
Appropriate support infrastructure	• Technical support could be brought to the bioregion • A supplementary energy source would be required for electricity generation and coal from established mines at Gunnedah and the Hunter are suggested.
Capacity to create opportunity for the Aboriginal Community	• Direct employment at a co-generation facility may be a possibility.
Community/Government support	• Consistent with government policy of generating electricity from renewable sources. • At the current time conservation interests do not support electricity generation from timber resources as it adds legitimacy to the coastal woodchip industry. • There is some potential for a co-generation proposal to meet with the same local opposition as the 1999 charcoal for silicon proposal.
Government assistance required	• Possible assistance with establishment grants.

The opportunity is marginal on a number of fronts. These include availability of resource to power the plant and the possibility of community resistance to the proposal. Emerging "gasifier" technology to meet the electricity needs of some of the larger mills in the region may be possible.

Utilise Waste to Part Fuel an Ethanol Production Plant

A proposal has been floated for the development of an ethanol plant in the north west of NSW (Mathew Kelley Engineers and US Delta Corporation). Three BBSB sites are being considered for the plant (Narrabri, Gunnedah and Quirindi).

The ethanol plant would produce a greenhouse friendly fuel from distilled sorghum and corn. The fuel is suitable for blending with petroleum for motor vehicle use.

The ethanol plant would be highly energy intensive. It is estimated that some 40% of the plants operating costs would be spent purchasing gas to fire distillation. The proposal has been floated that plant gas needs could be partially offset with forest mill and harvest waste.

Mathew Kelley of Mathew Kelley Engineers indicates that forestry waste would be a suitable fuel for an ethanol plant. Its economic viability as a fuel would be determined by transport costs and competing uses (eg briquette manufacture) for the waste.

Use of by-products in MDF or OSB production

The feasibility of a manufacturing plant producing Medium Density Fibreboard (MDF) or Orient Strand Board (OSB) was considered. There is insufficient timber resource in the region to support either of these manufacturing options. Industry advice is that a minimum throughput of 200,000 cubic metres per annum is required for plant viability.

Cypress poles for organic wine industry trellising

Linked to thinning State Forests to promote timber growth is the opportunity to generate additional poles for horticultural and vineyard trellising. The thinnings generated from an expanded silviculture program could be sorted and processed for horticultural poles. These poles have the added advantage of being pest resistant without the addition of chemicals. At least one player in the region has developed a niche market in the supply of cypress poles to the small organic wine industry.

TABLE 3F CYPRESS POLES FOR ORGANIC WINE INDUSTRY TRELLISING

Resource availability	• Linked to an expanded thinning program in State Forests within the bioregion.
Markets	• Cypress poles would find it very difficult to compete on price with treated pine grown on plantations i.e. “koppers logs”. • Market is likely to be confined to the organic sector eg organic wine and say kiwi fruit trellising • The wine industry may have reached a plateau for the current time. • A niche player already exists in this sector, additional supply may destroy a small market.
Employment created	• Thinning would generate employment. Minor additional employment from pole processing.
Capacity to attract investors	• Small opportunity. Existing player may be interested in receiving more supply
Scale of impact	• Minor.
Skills available	• Skills available in the region.
Appropriate support infrastructure	• Supply of inputs available from proposed thinning program. • Existing social and physical infrastructure would support this enterprise.
Capacity to create opportunity for the Aboriginal Community	• Employment in a thinning program.
Community/Government support	• Strong community support, thinning promotes biodiversity and timber industry viability plus utilisation of at least some of the by-product in a high value way.
Government assistance required	• No.

Minor opportunity and care needs to be taken not to flood the market of an existing player when that players main market is likely to be static over the next few years.

Supplementary cypress thinning

Under this proposal developed by *Friends of the Pilliga* public funds would be allocated for a public and private land cypress-thinning scheme. The scheme would supplement existing SFNSW programs on public lands. NSW Government funds would be invested in the bioregion to ensure the long-term supply of cypress timber. *Friends of the Pilliga* suggest a $250,000 annual investment in private lands and an additional investment of $500,000 per annum on public lands. They argue that thinning is unprofitable on private lands and that without government investment the future supply of sawlog will be exhausted. The industry is currently surviving of thinning work undertaken pre and post the Second World War. Investment could be funded from existing industry royalties. The investment is not profitable from a private perspective given the long maturation rates of cypress.

Furthermore *Friends of the Pilliga* argue that thinning dense cypress regrowth has biodiversity benefits. Thinning would reduce soil erosion and increase the diversity of plants and animals in cypress forests. Research at the Western Plains Zoo, by SFNSW and DLWC is understood to support this claim.

In addition to future sawlog supplies and nature diversity benefits the scheme has the potential to generate significant employment opportunities for local unskilled labour. It would also improve the grazing potential of cypress forests. The *Friends of the Pilliga* suggest long term binding agreements with private landholders to share royalties upon harvest of the timber in 40 and 80 years time.

The proposal is evaluated below.

TABLE 3G SUPPLEMENTARY CYPRESS THINNING

Resource availability	• Public land and local labour are highly available • Nature of the 'binding agreement" with landholders would determine the supply of private land for thinning. • Work team resources would be required (training, safety equipment, brush cutters, etc) • Capital funding from Government is the major hurdle.
Markets	• Linked to the health of the NSW cypress industry, which is currently very healthy.
Employment created	• Significant. Employment created for local indigenous, long time unemployed and youth.
Capacity to attract investors	• Reliance on public sector investors (eg NSW Government or CDEP).
Scale of impact	• Medium to large – it is proposed that 1,000 ha pa would be cleared on private lands and 2,000 ha pa on public lands.
Skills available	• Yes, possibly some training required.
Appropriate support infrastructure	• Yes, potential for support from State Forests, FPA and CDEP.
Capacity to create opportunity	• Yes, both in terms of directed employment and strengthening links

for the Aboriginal Community	to BBSB forests. Reviewed separately in Chapter 6.
Community/Government support	• Strong support from FPA, millers and local conservation interests.
Government assistance required	• Funding of $750,000 pa required plus program design, management and operating costs.

The proposal has potential to create synergies with opportunities that utilise cypress thinnings (*eg firewood harvesting from thinnings and waste*). The opportunity is not commercial in its own right but produces rare win-win outcomes for the timber industry and conservation.

3.3 HARDWOOD AND OTHER NATIVE TIMBER PRODUCTS

Opportunities for expansion of existing and new hardwood and other timber resource products were identified as:

- Further harvesting of ironbark timber driven by an industry strategic plan
  - Flooring
  - Power poles and cross arms
  - Sleeper production for railway infrastructure maintenance
  - Round farm fencing poles
  - Electric fence droppers
- Co-product investigations
  - Kino
- Furniture manufacture from a range of species
  - Sleeper backs, black cypress and bulloak
- Broombush, didgeridoos, bush foods, seeds and foliage
- Firewood harvesting

Harvesting of ironbark in association with Pilliga cypress

Ironbark is the most significant hardwood species in the BBSB. It was extensively harvested for railway sleeper production throughout most of last century. While the big trees that were the lifeblood of the sleeper cutting industry are gone, SFNSW indicate that a substantial 80-year-old regrowth resource is now about to come on line. Private forestry timber would add to this potential resource (provided it was harvested in a manner consistent with the native Vegetation Conservation Act). Originally, it was envisaged that a further 20 years of growth would be required to produce a timber suitable for commercial milling. However, trials of 40cm sawlog shipped to the coast and milled with new technology have produced very valuable hardwood flooring. At the current time the mill producing electric fence droppers at Baradine dominates a very small ironbark harvesting industry. It is suggested that a local integrated cypress and hardwood industry could be established in the Pilliga to utilise this resource. A stand-alone industry in the Goonoo and other parts of the BBSB State Forest estate may also be possible. A local industry could generate ironbark products such as:

- Flooring
- Power poles and cross arms
- Sleeper production for railway infrastructure maintenance
- Round farm fencing poles
- Electric fence droppers

Each of these opportunities is examined in the table below.

TABLE 3H FURTHER HARVESTING OF IRONBARK TIMBER

Resource availability	• Regrowth in significant volumes averaging 40 cm diameter about to come on line in the BBSB State Forests. • Potential to expand opportunity with development of the private property forest resource.
Markets	• Flooring: high value use with ready markets. • Power poles and cross arms: in demand for new and replacement infrastructure. Only limited resource available. • Sleepers: Strong demand for replacements, remains preferred material for bends and saves on blue metal ballast. Major service depot planned for Dubbo. • Electric fence droppers: Niche market ably satisfied by existing local player who exports worldwide. May be opportunity to prepare other electric fence components locally.
Employment created	• Potentially significant.
Capacity to attract investors	• Commercial opportunity with certainty of supply from State Forests.
Scale of impact	• Diversification opportunities for existing mill operations.
Skills available	• Skills available in the region.
Appropriate support infrastructure	• Existing social and physical infrastructure would support this enterprise.
Capacity to create opportunity for the Aboriginal Community	• Existing Aboriginal employment in mills. Opportunity for Aboriginal ownership of mills explored separately in Chapter 6.
Community/Government support	• Conservation interests may appose a major step up in ironbark harvest. However, advice is that a sustainable harvest is possible. • Other community members likely to be supportive. • Proposals would need to be mindful of previous bad image associated with sleeper cutters in the Pilliga and Goonoo.
Government assistance required	• No but industry notes that NVC Act requirements for Harvest Plans and increased mature tree retention makes utilisation of private land difficult. • FISAP funding may be appropriate • Possible assistance with preparing a strategic plan for a regional ironbark industry.

Substantial opportunity exists for the development of an integrated ironbark processing industry on the back of revised resource availability estimates. Realisation of this opportunity should be driven by an industry strategic plan similar to that formulated by the NSW Cypress Industry. This is a major recommendation of this report.

Co-product investigations – Kino

Kino is a by-product of "mugga" ironbark harvesting used in pharmaceutical production. "Mugga" ironbark is an icon species in the Pilliga and Goonoo and is not commercially harvested. "Mugga" ironbark is an important floral resource for the apiary industry. SFNSW has no plans to harvest this resource. Kino provides no immediate commercial opportunity for the region.

Furniture manufacture from a range of species

Furniture production is a high value, low volume use for native forest timber. It is able to utilise co-products from milling as well as a range of BBSB timber species. Sleeper backs, a by-product of historical sleeper cutting in the Pilliga, may be a suitable resource for furniture making. With appropriate investment in R&D other species including black cypress and bulloak may have potential as furniture timbers. Applebox and redgum have also been suggested. R&D might focus on stabilising the timber and improving cutting technology. A range of products would be possible. Products might include fine indoor furniture in the style of high value red gum products or rustic style outdoor "bush" products. It is understood that at leas one mill in the region is currently experimenting with timbers for furniture production.

TABLE 3I FURNITURE MANUFACTURE FROM A RANGE OF SPECIES

Resource availability	• Currently the resource consists of non-commercial species, thinnings and sleeper backs.
Markets	• Markets untested and there is no existing regional industry.
Employment created	• Minor.
Capacity to attract investors	• More likely to be consistent with a hobby style operation.
Scale of impact	• Small.
Skills available	• Additional entrepreneurial and craft skills would be required for manufacture of furniture. The proposed Cultural Heritage and Timbercrafts Centre at Baradine was forced to drop "timbercrafts" from its title due to a lack of local producers able to supply any volume of product.
Appropriate support infrastructure	• The industry would need to be established from scratch.
Capacity to create opportunity for the Aboriginal Community	• Existing Aboriginal employment in mills. Opportunity for Aboriginal ownership of mills explored separately in Chapter 6.
Community/Government support	• Conservation interests may oppose a major step up in ironbark harvest. However, advice is that a sustainable harvest is possible. • Other community members likely to be supportive. • Proposals would need to be mindful of previous bad image associated with sleeper cutters in the Pilliga and Goonoo.
Government assistance required	• No. • Possible assistance with preparing a strategic plan for a regional ironbark industry.

The opportunity for furniture production in the BBSB is minor. The industry would need to be established from scratch in the absence of an established market. An alternative scenario is that existing mills provide local special timbers to manufacturers in other regions.

Broombush, didgeridoos, bush foods, seeds and foliage

Potentially there are opportunities linked to the sustainable harvest, preparation and marketing of a range of other native timber products originating in the public and private forests of the BBSB. Already there is a CDEP harvest of broombush for fencing and timber suitable for didgeridoos. Harvesting of native cut flowers and foliage from native sources is illegal and consideration of this opportunity would need to be addressed through farming or a plantation. Other potential opportunities linked to forests include:

- Bushfood collection, processing and sale
- Bush medicine collection, processing and sale
- Seed collection from forests for either nursery establishment (to ensure a secure supply of bushfood/medicine species) or to provide stock for native vegetation re-establishment

These opportunities are considered in more detail in Chapter 6.

Firewood harvesting from thinnings and waste

As indicated above in the evaluation of firewood briquettes, the established firewood harvest industry is under pressure from legislation protecting fallen timber and standing dead trees. The objective of the legislation is to protect fauna habitat from destruction. An alternative to the current sourcing of dead timber on public and private lands is to utilise the by-products of thinnings and waste for commercial firewood sales. Firewood would be sourced from green timber and dried prior to sale. The proposal would need a phase in period to get both contractors and the market used to dealing with the change in resource and an industry strategic plan, similar to the CISP is suggested.

In addition to the outputs of an expanded thinning program other by-products (eg from hardwood processing) and non-commercial species (eg bulloak) could be sourced and processed for firewood. The resulting product would best be marketed as a “shandy” of high value (hardwood) and lower value (bulloak) species.

TABLE 3J FIREWOOD HARVESTING FROM THINNINGS AND WASTE

Criteria	Firewood harvesting from thinnings and waste
Resource availability	• Thinnings are an abundant underused resource that is available on both public and private land. • Securing resource access will be critical.
Markets	• There is an established market in urban areas (eg Blue Mountains) serviced by large-scale operations based in the region.
Employment created	• Switching from dead wood harvest to utilisation of thinnings may help sustain current jobs threatened by legislative changes.

Capacity to attract investors	• Opportunity for exiting and new firewood harvesters. More about switching resource than major capital investment.
Scale of impact	• Reasonable size opportunity. • Low margin on a small scale but big integrated operations with central handling and delivery by the semi-trailer are different.
Skills available	• Skills available in the region.
Appropriate support infrastructure	• Supply of material from SFNSW. • Appropriate road network in place.
Capacity to create opportunity for the Aboriginal Community	• Potential for a stand alone business that might be created with some form of grant money or Aboriginal investment funds. CDEP program currently directed at firewood cutting.
Community/Government support	• Likely in the short to medium term. In the longer term environment protection authorities seek to phase out solid fuel combustion heaters in metropolitan areas.
Government assistance required	• Resource access security under a WRA agreement.

This opportunity provides a potential solution to constraints on the existing firewood industry associated with restrictions on dead wood harvest. A phased transition would be required from sourcing dead wood to firewood industry reliance on thinnings and waste. A five to ten year strategic plan is suggested. Resource access is critical to the success of this opportunity and it would benefit from an expanded private and public sector thinning program.

3.4 PLANTATIONS, WOODLOTS AND AGRO-FORESTRY

Plantations, woodlots and agro-forestry provide a potential opportunity to:

- Meet demand for timber products (firewood, cabinet timbers);
- Establish new farm enterprises (seed orchards, bushfoods, medicinal/cosmetic plants, eucalyptus oil, cut flowers/foliage);
- Improve farm productivity (windbreaks, stock fodder, drought proofing, soil improvement, manage salinity recharge); and
- Manage regrowth for private native forestry.

These opportunities are reviewed below. In this study plantations are defined as large scale commercial investments, woodlots as dedicated farm scale enterprises and agro-forestry as strip style planting in association with crops or livestock.

Plantations to meet demand for timber products

Large areas of native timber plantation have been established on the coast and in high rainfall areas for timber and eucalyptus oil. The suggestion has been raised that plantations to meet future timber needs could be established in the BBSB. Plantations could be grown to cover a range of products from cabinet timbers to firewood (eg sugar gum).

Advice from the forestry industry is that while plantation-grown species achieve better rates of growth than regrowth, growth rates in the BBSB for plantation timber cannot match those achieved in high rainfall area. Superior rainfall and soils in these areas will attract commercial investment in plantations for the foreseeable future. Superior growth rates drive investment performance. The Hancock Natural Resource Group advise that while there is some capacity to trade-off lower growth rates with proximity to markets, the BBSB has neither of these features.

Woodlots and Agro-forestry for improved on farm performance

Plantations are currently being proposed on the Liverpool Plains at the foothills of the Liverpool Range. These plantations are expected to serve a dual purpose; firstly they will intercept runoff from the Liverpool range in a known recharge area and secondly they will supply fuel to a proposed silicon plant, on a sustainable basis. Supplying cabinet timber is an alternative. It is anticipated that these plantations will be harvested in 20 years time.

Woodlots grown on farm have the further potential to assist with shelter benefits for adjoining crops and pastures, provide shelter benefits for stock, increase farm productivity, provide timber for firewood, fencing and brushwood, honey and bees wax production, seed collection, aesthetic benefits, habitat for animals to help control pests, medicinal and perfume resources, improved recreation experiences and so on.

Economic performance of woodlots will depend on the interplay of on-farm benefits and income earned from thinnings and in the harvest year. RIRDC's Carbon Farmer Model[2] provides an opportunity for farmers to assess on farm woodlots on an individual farm basis. Key determinants of farm profitability from woodlots are identified as:

- Intended markets and stumpage price (which includes distance to markets);
- Growth rates;
- Thinning prices and costs; and
- Establishment and management costs.

A simple analysis of farm profitability of the establishment of 100 Ha of *Eucalyptus melliodora* (yellow box) woodlots in the BBSB for a representative farm is shown below. Yellow box can be used for cabinet timbers. On-farm production benefits of woodlots such as windbreaks and salinity recharge, are excluded.

Net Present Value over 20 years = (127,700).
Internal Rate of Return = not resolved

The table below shows the assumptions driving this result and the breakeven analysis. For the woodlot to be profitable the growth rate, stumpage price and establishment costs would need to change considerably. None of these breakeven results are likely in the BBSB. The implication is that the on-farm productivity benefits would need to be substantial, in the order of $130/Ha/yr for the 20-year period, before woodlots are considered for the region. This is also unlikely. Off-farm benefits (e.g. lower watertable rises in other locations) could directly substitute for the on-farm productivity benefits, but there is no current mechanism for these to be paid.

[2] Developed by Hassall & Associates (2001). Available through www.rirdc.gov.au. The carbon related costs and benefits are set to zero so that only the timber activity is considered. There is no current market for the carbon benefits created.

TABLE 3K WOODLOTS, AGRO FORESTRY – ASSUMPTIONS AND BREAKEVEN ANALYSIS

Assumption	Assumed value	Breakeven value
Establishment cost ($/Ha)	2,500	1,000
Growth rates	Moderate growth of about $7m^3$/year [MAI]	Extremely high growth of $17m^3$/year [MAI]
Stumpage price ($/$m^3$)	30	75
On farm productivity benefits	N/a	~$130/Ha/yr

An alternative species is Mugga Ironbark (*E. sideroxylon*), which is a dense timber suitable for the proposed silicon plant. However, it has very low growth rates and is also not likely to be profitable.

Stock fodder plantations

The planting of tree crops for stock fodder has been around as an idea for some time. There are a range of suitable species including kurrajongs and certain acacias. As with plantations and woodlots, profitability will be determined by growth rates and lower rainfall areas such as the BBSB will be marginal.

Seed Orchards

Seed orchards are a relatively new idea. Their emergence as a potential enterprise is linked to the development of markets for native tree and shrub species for revegetation to control salinity and other land management problems. In theory seen orchards can be established anywhere. High value low volume seed will stand high long distance transport costs. Seed orchards need to be managed as a crop and farmers need to be aware of agronomy, weeds and so on. There is a small seed orchard operating near Wee Waa. Tim Verco, CSIRO Tree Seed Centre is a potential source of additional information on this opportunity. A series of small seed orchards may be possible on individual farms in the BBSB. However, long lead times between planting and harvesting, low growth rates and the need to compete against wild harvesting, would seem to make this a marginal opportunity.

Managed regrowth

An alternative to planting of timber species on farm in the BBSB is a more active management of on-farm regrowth for timber production. Large areas of cypress and ironbark regrowth exist on private lands in the bioregion and most of this resource is not managed for forestry returns.

Simple silviculture practices such as thinning, improve growth rates and the eventual harvest value of the timber. Thinning could be timed to fit in with quiet periods on the farm calendar. It is noted that the provisions of the Native Vegetation Conservation Act need to be complied with before thinning activities can be contemplated.

Advice from the forestry sector is that slow regrowth rates, especially for ironbark mean that a viable economic return from regrowth management is unlikely. Harvest time is simply too far into the future to recoup investment cost outlays (thinning costs).

A multi criteria analysis of plantations, woodlots and agro-forestry is presented in the table below.

TABLE 3L PLANTATIONS, WOODLOTS AND AGRO-FORESTRY

Resource availability	• Land is available to establish tree-based enterprises but rainfall and soils are sub-optimal.
Markets	• Markets for firewood and commercial timber species are available. Distance to markets (a cost) is an issue.
Employment created	• Minor.
Capacity to attract investors	• Most likely as an on-farm diversification opportunity. • Distance to markets and rainfall limit investor interest.
Scale of impact	• Small to medium.
Skills available	• Skills are available from foresters both in and outside the region. A wealth of data is available from RIRDC and other research and extension agencies.
Appropriate support infrastructure	• Yes, especially for conventional products such as firewood and mill timber.
Capacity to create opportunity for the Aboriginal Community	• Employment in a thinning program.
Community/Government support	• Community is likely to be supportive.
Government assistance required	• No. • Idea has been raised for an active thinning program on public lands to promote timber and biodiversity but hard to justify in private areas.

The opportunity is constrained by the natural attributes of the bioregion. Environmental benefits, for which markets are still emerging, would have to be significant for these options to be viable from a commercial perspective.

3.5 APIARY PRODUCTS

Apiary opportunities

Apiary is a major forest based industry in the BBSB. Products include honey, sale of packaged bees, wax and queen bees bred to establish new hives. Opportunities to expand this sector were identified as:

- Branding and marketing initiatives including Pilliga branding to capture domestic and export premiums for certified chemical residue free products, selling directly on Sydney grower markets and establishing new markets. New markets may be sought for sales of honey into destinations as varied as an input into new health/medical products or application to popcorn.
- Co-product development based on wax including potential in cosmetics, medicinal products, cleaning products (such as floor polish and leather creams) and candles.
- Tourist attraction linked to regional tours and tourism products (like Mudgee Honey Centre – was one in Inverell that folded).
- Additional packaged bee exports and pollination service sales.

Royal jelly sales were investigated and established as being non economic given the very low price of imported Asian product.

Each of these opportunities is examined in the table below.

TABLE 3M FURTHER DEVELOPMENT OF THE APIARY SECTOR

Resource availability	• Continued access to forest resources is a major issue for the NSW apiary industry. Conversion of State Forest lands to national parks has resulted in closure by stealth in other areas – roads are shut off and practical access denied. • Surplus apiary sites currently available in the region – road access difficult. • Continued growth of success stories like live bee exports is dependent on keeping sites/access • Any upturn in ironbark harvesting may deplete floral resource suitable for apiarists (but may assist with access) • Pilliga and Goonoo provide an important reserve for replenishing bees after pollination services • Pilliga and Goonoo are also remote and therefore provide opportunities for marketing “chemical free’ product.
Markets	• Nationally there is a shortage of honey at the current time. • Growth in horticultural crops eg almond production, anticipated to generate additional demand for apiarist pollination services. Bees need to over-winter in areas like the BBSB to replenish strength after pollination is complete. • Export sales could be increased by up to 100% in the short term. • Branding: Pilliga honey, due to its isolation from cropping areas, is considered a chemical free product with export value (European markets). Marketing on grower markets and sales as inputs for products like popcorn may provide minor opportunities to grow industry value • Co-products: potential for niche marketing into high value low volume sectors like candles and cosmetics.

	• Tourism: potentially a small part of an overall regional tourism package. Tourist safety may be an issue. • Packaged bees and pollination: industry discussions indicate potential for additional package bee and pollination service sales. International demand for packaged bees currently exceeds supply.
Employment created	• Incremental employment possible, especially through growth of packaged bee exports. Apiarists indicate that lack of training limits new entrants.
Capacity to attract investors	• Potential for new apiary operations.
Scale of impact	• Significant growth possible.
Skills available	• Skills available in the region. Additional skilled workers would add to industry strength as would improve access to training and extension. • R&D required for products such as medi-honey and bee nutrition.
Appropriate support infrastructure	• Road access to remote sites and maintaining access to existing sites is important to future growth.
Capacity to create opportunity for the Aboriginal Community	• Potential for Aboriginal involvement in the industry. • Employment with export bee operations possible. • Native bee honey could be explored, believed to sell at $100 kg "farm gate". • Opportunity would most likely revolve around purchase of an existing apiary operation. • Beneficial linkages could be developed through Land Councils – training plus employment in exchange for access to lands for siting hives.
Community/Government support	• Community is generally supportive of apiary operations. Some Conservation interests may object to the presence of European honeybees in a largely native environment.
Government assistance required	• Security of resource assess is important and government can assist with this. • Road access and continuation of access in national parks also important. • Apiary training, delivered locally by TAFE plus additional NSW Agriculture extension staff, would also be of assistance

With necessary resource security the BBSB has potential to grow both in the scale of existing operations and attract additional operators. Resource access is critical.

3.6 GRAZING

Grazing of sheep and cattle in State Forests is a minor industry in terms of gross values generated. However, State Forest permits provide an important management tool for local farms. Permits provide flexibility for farm managers especially during droughts or for opportunistic feeding following heavy rains. Continued access to forest grazing is important to local landholders. No specific opportunities are identified for grazing.

3.7 TOURISM AND RECREATION

Opportunities to build on existing forest based tourism and recreation were identified as:

- Cultural Heritage Centre and Community Forest, Baradine
- Tours and Eco-tourism
- Camp Cypress, Adventure Camp for School Children
- Regional Tourism Organisation to focus specifically on the bioregion
- Maps and Guides
- Tourism Infrastructure

These opportunities are described and evaluated below. Tourism is defined to include overnight accommodation and usually involves visitors from out of the region. Recreation is associated with day trips by local or regional residents.

Pilliga Cultural Heritage Centre, Baradine

Plans are well advanced for a Pilliga Cultural Heritage Centre at Baradine. A feasibility study (Timby Rural Services, January 2000) and a Business Case (Aurora Practical Solutions Pty Ltd, August 2001) have been prepared, support material collated, a professional fundraiser (Andrew Baulch, Andrew Baulch Consulting Pty Ltd) and architect (Alan Croker, Design 5 Architects) engaged. A board of management has been formed that includes both Aboriginal representatives and business people from Baradine. In its original form the centre was to include timbercrafts but supply of product from local crafts people was determined to be insufficient to meet potential demand. The Centre provides opportunity to create a generic logo and brand products of the region. It is understood that in its current form (Aurora Practical Solutions Pty Ltd, August 2001) the Centre will be located in the proposed community forest at Baradine. The centre will address pre-European history, European history and future forest management. It will provide opportunities for:

- Tourism (museum space/keeping place, gallery, eco-tourism)
- Education (school groups, visitors, etc)
- Training/cultural awareness training (visitors, Aboriginal studies)
- Retail and wholesale sales (sale of arts/craft, local produce)

The overall merit of the Pilliga Cultural Heritage Centre is reviewed here. Specific opportunities for the Aboriginal community of the bioregion are reviewed in chapter 6.

TABLE 3N PILLIGA CULTURAL HERITAGE CENTRE, BARADINE

Resource availability	• Site in Community Forest at Baradine has been allocated. • Initial funds for investigation have been made available and utilised. • Funds for construction and operation are needed and a professional fundraiser has been employed. There is a realistic chance that sufficient funds will be found to construct the Centre. The Foundation for Regional and Rural Renewal has recently contributed $30,000 and a presentation has been made to the NSW Premiers Department.
Markets	• Draw on existing visitor market, 160,000 visits per annum to Coonabarabran, 1.2 million visits to the BBSB (Tourism NSW

	1996/97). • Note that Baradine is not on a main highway and visits are likely to be a lot less than the Coonabarabran LGA total.
Employment created	• Significant when direct (visitation) and indirect activities (tours, education, product manufacture, etc) considered.
Capacity to attract investors	• Largely reliance on public sector investors. • In-kind support can be anticipated from the community.
Scale of impact	• Medium to large if associated activities/opportunities can be successfully tapped.
Skills available	• Training required in interpretation of museum materials and retailing but potential employees should be able to be drawn from Baradine.
Appropriate support infrastructure	• Yes, support from State Forests, other state agencies and local groups.
Capacity to create opportunity for the Aboriginal Community	• Significant, and this is dealt with separately in Chapter 6.
Community/Government support	• Strong support from both local indigenous and non-indigenous communities. • Process needs to be put in place to mange local rivalries with Coonabarabran and the potential for a similar facility at Narrabri.
Government assistance required	• Establishment and possibly operational assistance required.

The Centre has broad based support from both the local indigenous and non-indigenous community. The centre is potentially an important boost for a community that has declined as forestry operations have contracted. The Centre provides the potential for a centrepiece following BBSB Assessment negotiations that could act as a catalyst for local tourism and recreation opportunities. It is recommended that the Centre be given priority consideration for investment.

Tours and Eco-tourism

Linked to the Cultural Heritage Centre are opportunities associated with tours and eco-tourism. The BBSB is rich in tourism and recreation attractions, including the Warrumbungle's, Mount Kaputar, the Siding Springs Telescope, the Pilliga Forest, the Goonoo Forest (important recreational resource for Dubbo) and so on. Successful tourism enterprises include Pilliga Pottery and Cuttabri Wine Shanty. Attractions are of sufficient quality to overcome the relative remoteness of the region. Themes and events such as the biannual "Celebration of the Pilliga" and the forthcoming 50 year anniversary of the founding of the Warrumbungle National Park provide a platform to launch tours and eco-tourism. Additions to the current "product" offering suggested during consultation include:

- Additional walking tracks
- 4WD, car, bike and horseback tours
- Bird watching, day and night wildlife tours (koala populations and bird rich area)
- Timber History and Aboriginal cultural tours
- Accommodation on farms able to offer "eco" experiences
- Accommodation packaged with tours in bed & breakfasts and pubs
- Retreats or resorts with a forest theme (camping, cabins or upmarket)

Each of these activities potentially provides the opportunity for a part or stand alone local business. There are many long-standing successful enterprises in the region and new ones with a focus on 'eco-tourism" commencing. Grouping of products increases their attractiveness to visitors and the presence of the Cultural Centre could act as a regional "drawcard" from which other opportunities can be promoted.

TABLE 3O TOURS AND ECO-TOURISM

Resource availability	• Yes, forests and national parks with wild areas and wildlife available • The region offers a rare 'fail safe" opportunity to see koalas in the wild.
Markets	• Region has visitation on which to build • Area is remote (drawback) • Themes could include history, environment, sustainability, biodiversity, 4WD, isolation, natural (PEDTC inaugural meeting minutes) • Individual enterprise business plans would need to be built on realistic expectations of visitation and it is suggested that a second form of income be available to entrepreneurs in the early years of new activities.
Employment created	• One full time employee per operation would seem a reasonable average.
Capacity to attract investors	• Not reliant on large amounts of establishment capital unless new accommodation was planned.
Scale of impact	• Small to medium.
Skills available	• Enterprises might benefit from training in hospitality and programs such as "Aussie Host". Business planning is also suggested.
Appropriate support infrastructure	• Some infrastructure would benefit from upgrading – roads, maps, walking tracks, etc (see analysis of option below). • Local council tourism officers and NSW Tourism provide essential back up support as well as vehicles for promotion (eg visitor newspapers)
Capacity to create opportunity for the Aboriginal Community	• Significant, and this is dealt with separately in Chapter 6.
Community/Government support	• Strong support from community and government. SFNSW have indicated their preparedness to facilitate opportunities development.
Government assistance required	• Assistance through NSW Tourism.

Tourism and tours are well established in the region and new players are developing "eco" themes. This group of opportunities provides a useful synergy with the Cultural Heritage Centre. The worth of this group of opportunities will depend on the "business cases' of the individual enterprises proposed.

Camp Cypress, Adventure Camp for School Children

A further opportunity with linkages to tours, eco-tourism and the Cultural Heritage Centre is Camp Cypress. Camp Cypress, to be based at the Baradine Showground, is to provide USA style education and recreation activities in a "summer camp" format for city school children. Activities will include horse riding, rock climbing, nature walks, hiking and caving. The Camp will also incorporate a caravan park and casual accommodation. The Camp has recently been funded under the Commonwealth's Regional Solutions Program. Synergies that could be developed between the Camp and forest based development include:

- Aboriginal studies
- Aboriginal cultural heritage tourism
- Visits to the Cultural Heritage Centre
- Eco-tourism (flora and fauna tours)
- Tours to regional nature based attractions
- Tours to regional industry operations including timber mills, apiary, farming and grazing

The Camp provides a valuable conduit for BBSB activities. It is understood that proposals are currently being developed to ensure insurance cover is available to the Camp.

Regional Tourism Organisation

The bioregion currently straddles two New South Wales Tourism regions (Explorer Country and Big Sky Country) and finds itself marginalised in the promotion of both areas. A proposal has been advanced that local tourism organisations band together and create a separate entity for the bioregion. The Regional Tourism organisation would create further linkages between local government, the Pilliga Cultural Heritage Centre, Camp Cypress and NSW government agencies (eg NPWS). A Regional Tourism organisation would:

- Be responsible for branding and promotion of the region
- Undertake cooperative marketing to maximise returns from investment
- Utilise web based promotion
- Create generic "Pilliga products"
- Work in with regional development

The work of the Regional Tourism organisation would include the coordination and production of maps and guides for the bioregion.

Maps and guides

The region is currently in the process of preparing and upgrading maps and guides to encourage tourism and recreation. For example David Johnston's *Bird Routes of Baradine and the Pilliga* and a plant guide by Anthony O'Halloran. Additional maps and guides of value would include:

- A koala map highlighting known koala areas.
- Brochures directed at self-guided tours.
- Upgrades of the various SFNSW maps following negotiation of the BBSB Assessment (eg the Pilliga Forestry Map). Maps would include interpretive material, highlight attractions and be used to promote visitation to the region.

Both the PEDTC and the Baradine Progress Association are currently seeking funding for map upgrades from DSRD, local councils and SFNSW. This opportunity is really about the provision of basic tourism and recreation infrastructure.

Tourism Infrastructure – walking trails, roads signs, roads and camping grounds

A key issue identified in relation to tourism and recreation during consultation was the upgrade of infrastructure to support tourism activities. Public sector investment identified included:

- Walking tracks – upgrade of existing tracks and provision of new walking tracks throughout the whole region. Specifically a nature walk along the Baradine Creek was suggested.
- Road signage to promote visitation to attractions within forests including "tourist forest drives", wildlife signs and road signs within the Pilliga. At the current time navigation in the Pilliga is a bit of a challenge and people have been reported lost for a couple of days at a time. Assistance from SFNSW may be appropriate for this form of investment.
- Identify and name a regional tourism route.
- Roads to improve tourism access. Specifically Tourist Drive No 2 needs upgrading. Costing could be sort from SFNSW and local government.
- Camping grounds that meet not only the basic needs of "white wanderers" but also family groups who seek showers, toilets and drinking water.
- Telephone communications, including the "reach" of mobile phones.

The point was made that regardless of whether site tenure was held by SFNSW or NPWS, the NSW Government needs to provide funds to improve access and facilities. Improvement of tourism infrastructure: walking tracks, road signage, roads and camping grounds would be a practical and long lasting outcome of the BBSB Assessment.

4. OPPORTUNITIES FOR THE ABORIGINAL COMMUNITY

4.1 INTRODUCTION

Much of the participation of indigenous people in regional economies takes place within the mainstream economy, that is within a range of primary industries at all stages of value-adding to those industries, and in a wide range of other mainstream economic activities (Tayner 1999). For example the NSW cypress industry is a significant employer of indigenous people. How this involvement can be increased is still, of course, an issue.

This section of the report allows specific consideration of those opportunities not considered in Chapter 3 - that are identifiably indigenous in content and ownership (e.g. bush foods, medicines, Aboriginal owned timber mills, etc).

The origins of these opportunities are a series of meetings and follow up interviews with representatives of the Aboriginal community in the BBSB. A list of persons contacted is provided as an appendix.

This chapter presents an overview of the BBSB indigenous social profiling completed in Stage 1 along with a review of major issues identified during consultation before "longlisting" and evaluating specific opportunities. Finally conclusions on preferred opportunities are presented.

4.2 SUMMARY OF STAGE 1 BBSB INDIGENOUS SOCIAL PROFILING

An indigenous social profile of the bioregion was prepared as part of the Economic and Social Assessment of the Brigalow Belt South Bioregion (RACD, CARE, EBC 2000). In all some 27 profiles were selected. Conclusions drawn from selected profiles relative to the NSW rural average included:

- Above average unemployment rates and below average household income in indigenous areas in the BBSB. Coonabarabran being particularly high on these indexes.
- Indigenous areas had low school retention rates, low numbers of people with qualifications and high numbers of people working as labourers or similar employment. Gunnedah was particularly high on these indexes.
- There were a large number of one-parent families, persons separated or divorced and persons living in rental accommodation in indigenous areas.

- There were high numbers of young people in indigenous areas and few persons over 65 years in age.

In summary, the BBSB indigenous community is a young one with high unemployment rates, low income and few qualifications, or presumably, entrepreneurial skills. Opportunities for development of forest-based industries were assessed against this background.

4.3 ISSUES RAISED

Consultation with representatives of the BBSB Aboriginal community raised the following overarching issues when considering indigenous forest based opportunities:

- The principal issue when considering forest-based opportunities is the generation of employment for Aboriginal people. In particular sustainable employment, "real jobs" with potential to last rather than short-term government program generated opportunities.
- Think scale! Too often Aboriginal opportunities are about fiddling around the edges collecting seeds and nuts. Think of significant opportunities with potential to generate real income and employment, what about Aboriginal people owning and running a cypress mill?
- The proposed cultural heritage centre at Baradine is important as a direct and indirect employment opportunity as well as an opportunity for Aboriginal people in the BBSB to "tell their story".
- ATSIC Community Development and Employment projects (CDEP) provide an opportunity to make use of indigenous labour with constraining on-costs, like insurance, already paid. The products produced by these programs provide a potential retailing opportunity.
- Proponents of Aboriginal development opportunities need to be aware of relevant cultural sensitivities in relation to opportunities (eg tourism linked to sacred or mission sites) and the desire to retain an attachment to a particular place.
- The consultants needed also to be aware of the degree of divergence of view within the regional Aboriginal community about what is and is not acceptable in terms of development opportunities.

These overarching issues along with the information provided in the socio-economic profiling and the criteria used to evaluate opportunities in Chapter 4 are used to assess opportunities. The longlist of opportunities for the Aboriginal community in the BBSB has its origin in a workshop held in Baradine with the Pilliga Forest Aboriginal Management Committee (April 2002). The longlist of opportunities generated by this meeting is attached as an appendix.

Opportunities that are identifiably indigenous in content and ownership include:

1. Cultural Heritage Centre and Community Forest, Baradine
2. Aboriginal art and craft production and retailing
3. Bushfoods, medicines and seeds
4. Greenwood firewood
5. Supplementary cypress thinning
6. Aboriginal cultural heritage tourism
7. Aboriginal studies
8. A large scale investment in a regional cypress mill
9. Commercial apiary
10. Site assessment consultancy services to the mining sector
11. Public sector employment opportunities
12. Aboriginal management of national parks and culturally significant sites

4.4 CULTURAL HERITAGE CENTRE AND COMMUNITY FOREST, BARADINE

The proposed Cultural Heritage Centre and Community Forest at Baradine provides an opportunity for local Aboriginal people to tell their story and a keeping place for artefacts.

In addition to the evaluation of the Cultural Heritage Centre completed in Chapter 4, the proposed development provides a number of economic opportunities that are identifiably indigenous, including:

- Direct employment (hosting and interpreting)
- Sale of crafts and art which have limited outlets at the current time
- A focal point for cultural tours and interpretation
- A centre for Aboriginal studies

The Cultural Heritage Centre is an important focus for the local Aboriginal community. The centre is likely to employ a full time curator, two staff and tour operators (pers comm. Andrew Baulch). It is important that local Aboriginal people fill half of these positions.

TABLE 4A CULTURAL HERITAGE CENTRE AND COMMUNITY FOREST – ABORIGINAL PERSPECTIVE

Resource availability	• Site and some funding resources in place. • Aboriginal support critical to proposal's success
Markets	• Draw on existing visitors and provide outlet for arts/craft, Markets are largely untested, limited local sales of art and craft, focal point for tours and a centre for Aboriginal studies
Employment created	• Significant, higher value positions requiring skills and training (curator, Centre staff, tours, etc).
Capacity to attract investors	• Reliant on public sector investors.
Scale of impact	• Medium to large with spin-off activities (tours and arts/craft).
Skills available	• Training required for higher value positions.
Appropriate support infrastructure	• Yes, from State Forests, other state agencies and local groups.
Community/Government support	• Strong community support for the proposal.
Government assistance required	• Establishment and possibly operational assistance required.

The centre is a priority opportunity for Aboriginal people in the bioregion. It provides a catalyst for other opportunities and these are detailed below.

4.5 ART AND CRAFT OF THE REGION, PRODUCTION AND RETAILING

ATSIC Community Development Employment Projects (CDEP) provide local Aboriginal communities in the BBSB with resources and a structure in which to produce art and craft. There is a CDEP program in most towns and villages in the BBSB. The Wiawa CDEP embracing Narrabri, Wee Waa and Pilliga employs up to 90 people and has programs in arts and craft, firewood cutting and landscaping. The Wiawa CDEP arts and craft group produce paintings, sow, harvest timber for didgeridoos and make boomerangs. Many of the crafts produced rely on a supply of raw material from BBSB forests. Retail outlets for CDEP products are currently limited and while additional space may become available at the cotton heritage centre at Narrabri, an additional outlet in the proposed Cultural Heritage Centre at Baradine would be welcome. Additional sales through the Cultural Heritage Centre (and cotton heritage centre at Narrabri for that matter) would provide impetus for production and increase the sustainability of the CDEP program in the region.

In addition it has been suggested that an "art of the region" theme could be developed in gallery and sales space in the Cultural Heritage Centre at Baradine (Andrew Baulch per comm.) Again this would give an extra impetus to local artists.

TABLE 4B ART AND CRAFT OF THE REGION, PRODUCTION AND RETAILING

Resource availability	• CDEP program expected to continue for the foreseeable future. • Access to small volumes of resource (eg bloodwood and box for didgeridoo timber) from State Forests required on a continuing basis.
Markets	• Markets are largely untested, limited local sales of art and craft at the current time. Indigenous art and craft very popular with visitors in other locations. • Well-established market for didgeridoo timbers.
Employment created	• Significant, skill based and meaningful.
Capacity to attract investors	• Requires little capital • Potential to be self-funding in the longer term.
Scale of impact	• Medium.
Skills available	• Training may add to the existing arts and craft skill base.
Appropriate support infrastructure	• Infrastructure in place through CDEP, boost would be provided by retail outlet at the Cultural Heritage Centre.
Community/Government support	• Support would be likely.
Government assistance required	• Continuation of CDEP assistance through ATSIC. • Access to forest resources for small volume raw materials. • Support for the Cultural Heritage Centre.

An Aboriginal regional art and craft theme could be developed and additional sales encouraged through the Cultural Heritage Centre without incurring significant additional cost. This opportunity builds on current strengths and programs.

4.6 BUSHFOODS, MEDICINES AND SEEDS

Three linked opportunities with potential to fit in with CDEP programs and sales opportunities at the Cultural Heritage Centre at Baradine are:

- Bushfood collection, processing and sale.
- Bush medicine collection, processing and sale.
- Seed collection from forests for either nursery establishment (to ensure a secure supply of bushfood/medicine species) or to provide stock for native vegetation re-establishment.

As part of the Western Regional Assessment in the BBSB comprehensive data on bushfood and medicine species have been collected by NPWS. Relevant species in BBSB forests with immediate appeal include quandong, naipan, bumble or wild orange, googa or little banana, wild tomato and a small wattle resembling native rosemary with strong antiseptic properties. Quandong would appear to be difficult to propagate from seed and this and other native forest species would benefit from further R&D. Aboriginal Land Councils throughout the BBSB have access to land that may be suitable for nursery cultivation. This group of opportunities is evaluated in the table below.

TABLE 4C BUSHFOODS, MEDICINES AND SEEDS

Resource availability	• CDEP program with the capacity to channel labour to this opportunity are expected to continue into the foreseeable future. • Access to State Forests for seed, nut and fruit collection required on a continuing basis.
Markets	• Broader community interest in native foods and natural medicines but marketing channels would need to be established. This opportunity might link in with indigenous/eco-tourism proposals as well as the cultural Heritage Centre • New markets for native nursery may emerge over time as revegetation of private land is encouraged. It is understood that SFNSW has some interest in Aboriginal participation in native nurseries and seed collection.
Employment created	• Potentially significant and restabilises traditional links to land and knowledge.
Capacity to attract investors	• Requires little capital especially if land is already available for the nursery establishment option.
Scale of impact	• Medium.
Skills available	• Training may add to existing indigenous knowledge of bushfoods and plants - assistance would be required with nursery establishment (including R&D).
Appropriate support infrastructure	• Infrastructure in place through CDEP, boost would be provided by retail outlet at the Cultural Heritage Centre.
Community/Government support	• Support would be likely.
Government assistance required	• Continuation of CDEP assistance through ATSIC. • Access to forest resources • SFNSW could wave licence fees payable on materials collected. • Support for the Cultural Heritage Centre.

Bushfoods, medicines and seed collection/propagation provide an opportunity to further tap CDEP funds, make the most of emerging opportunities such as the Cultural Centre and private/SF interest in revegetation. It also provides the opportunity to showcase local knowledge and something that is regionally unique. This option should be carried forward.

4.7 GREENWOOD FIREWOOD INDUSTRY

Current CDEP programs include harvesting of dead wood from BBSB forests for firewood. The firewood is sold to local homes. Interest has been expressed in establishing a green wood industry whereby CDEP labour would utilise harvest by-products and actively manage the green timber by turning it on a weekly basis. Turning speeds the drying process and shortens the time required for product to reach a marketable quality. An integrated operation could be developed from CDEP activities that included bush cutting, turning, haulage, yard establishment, sales and delivery.

TABLE 4D INTEGRATED GREENWOOD FIREWOOD INDUSTRY

Criteria	
Resource availability	• CDEP program with the capacity to channel labour to this opportunity are expected to continue into the foreseeable future. • Access to State Forests for resource on a continuing basis including access to thinnings and waste products.
Markets	• Local markets plus work in with existing contractors to prepare firewood for sale to metropolitan markets eg drying, cutting, haulage, etc
Employment created	• Potentially significant.
Capacity to attract investors	• Requires little capital especially if land Council land is already available.
Scale of impact	• Medium to large.
Skills available	• Skills available through CDEP programs.
Appropriate support infrastructure	• Infrastructure in place through CDEP, boost would be provided by integration with commercial dead wood suppliers.
Community/Government support	• Support would be likely.
Government assistance required	• Continuation of CDEP assistance through ATSIC. • Access to forest resources • SFNSW could wave licence fees payable on materials collected.

This opportunity needs to be considered in conjunction with opportunities evaluated in Chapter 5 (*firewood harvesting from thinnings and waste/co-product utilisation – briquette manufacture from mill waste*). The addition of CDEP labour plus links with existing commercial players has the potential to increase the viability of green firewood proposals.

4.8 SUPPLEMENTARY CYPRESS THINNING

Similarly the cypress-thinning proposal developed by *Friends of the Pilliga* and detailed in Chapter 5 provides an opportunity for local Aboriginal employment. The proposal has the potential to generate employment and provide a limited amount of basic training. The proposal is also consistent with a "management of country" approach that may strengthen indigenous ties to the forest and improve the balance of species on public and private lands. The proposal should be advanced with Aboriginal involvement.

4.9 ABORIGINAL CULTURAL HERITAGE TOURISM

Two major opportunities present themselves for Aboriginal cultural heritage tourism in the BBSB and both would work in well with the proposed Cultural Heritage Centre at Baradine. The first opportunity is in relation to cultural education (dance, music and language), the second linked to tours of natural, and potentially, culturally significant sites. The Cultural Heritage Centre would provide a focal point or even a venue for cultural events and a staging point for various tours.

Aboriginal people consulted as part of this study expressed a preference for cultural heritage tourism linked to dance, music and language before access to sites. A staged approach involving access to sites may then potentially be possible. Under this approach visitors who have participated in cultural events may then be offered the opportunity to visit culturally significant sites with an Aboriginal guide. This "package" is not currently available elsewhere and is potentially very valuable to both Aboriginal people and the visitor. NPWS indicate that the BBSB region is rich in cultural heritage sites. The opportunity provides potential to capture some of the Aboriginal tourism opportunities that are now the almost exclusive domain of the Northern Territory.

In addition to the possibility of access to sites, Aboriginal guided tours in the bioregion might also include visits to points of natural beauty, areas like the "Aloes" where koalas may be viewed and to European historical sites such as Wooleybah Mill. Tours of this nature would create synergies with proposals outlined in Chapter 5 to upgrade hard and soft tourism infrastructure (eg roads and maps).

Local tours could be linked with regional and western NSW heritage trails to draw visitors into the region from further a field. Known trails include:

- Wentworth to Bourke Aboriginal Heritage Trail (Evelyn Crawford has details); and the
- Proposed Dubbo, Narromine, Nyngan, Bourke, Brewarrina, Walgett, Narrabri, Pilliga, Warrumbungle, Gilgandra and Dubbo loop (Andrew Baulch has details)

This group of opportunities may also benefit from training for Aboriginal people in areas as diverse as hospitality, guiding and recognition and interpretation of cultural sites.

This opportunity may be able to be realised in the first instance by targeting the school education market and attempting to attract school tours. The Proteus Management Group (1999, page 56) outline the following reasons why this would be a preferred strategy for Aboriginal eco-tourism in the Southern RFA, reasons included:

- School groups can be accommodated in "camp" style accommodation and will not require more sophisticated after hours entertainment. Camp Cypress would be ideal
- The experience can be build into a curriculum through enlisting the assistance of professional teachers and the Department of Education

- Preparation of "project Guides" for education groups, prepared with the assistance of professional educators, can provide a source of sales revenue
- The long term effects of building interest in school groups for regional heritage tours is that they are likely to influence parents and carers to come to the region

An evaluation of the opportunity is detailed in the table below.

TABLE 4E ABORIGINAL CULTURAL HERITAGE TOURISM

Resource availability	• Dance, music and language would need a venue (Cultural Heritage Centre?) although there is some argument for having teaching, especially by Elders, "in situ" in the forest. • Tour infrastructure (vehicles, maps and access arrangements) and training would be required. • People and "site" resources are available.
Markets	• Initial market of school groups is suggested but this could be grown to include bus tour groups from centres such as Dubbo and individual visitors.
Employment created	• Modest employment potential but also provides opportunity to reinvigorate local culture and inform/educate visitors.
Capacity to attract investors	• Public sector funding required.
Scale of impact	• Medium.
Skills available	• Training may add to existing indigenous knowledge of culture and sites.
Appropriate support infrastructure	• Infrastructure including venue, maps and roads required.
Community/Government support	• Broad community/government support would be likely. • Care would need to be exercised in ensuring that access to culture for commercial purposes was not divisive in the Aboriginal community.
Government assistance required	• CDEP assistance. • Support for the Cultural Heritage Centre.

The opportunity for Aboriginal cultural heritage tourism in the BBSB warrants advancement.

4.10 ABORIGINAL STUDIES

Incorporating Aboriginal studies within the bioregion's product mix could create further synergies between the proposed Cultural Heritage Centre and Aboriginal cultural tourism.

Four types of study have been suggested, they are:

- School group education in language, music and dance. School group education could be linked to cultural tourism, the Cultural Heritage Centre or Camp Cypress. A two-day language camp linked to Camp Cypress has been suggested.

- University studies including development of new field study modules or relocation of existing fieldwork currently completed by students in the Northern Territory. Macquarie University's "Warawara Centre" would be one possibility (contact Sam Ultman at Warawara).
- Rural community familiarisation training for medical students. A number of universities have introduced familiarisation packages for students to learn about and understand rural communities in an effort to attract doctors to rural practice. A short Aboriginal study module, delivered through the Cultural Heritage Centre, could be incorporated into this training.
- Training for Aboriginal youth in local cultural practice. Local Elders could undertake training. The Cultural Heritage Centre museum/keeping place would provide both a venue and a collection of resources for education purposes.

Opportunities linked to Aboriginal studies are evaluated in the following table.

TABLE 4F ABORIGINAL STUDIES

Resource availability	• Any form of study would require curriculum development • Are there still Elders in the region to impart knowledge? • Study would need a venue, potentially with accommodation. It is understood that a separate proposal exists for developing a motel and/or conference venue on Land Council land at Narrabri.
Markets	• As with cultural tourism, an initial market of school groups is suggested and the synergy with Camp Cypress is obvious. • The initial market could be grown to include training for Aboriginal youth, University students completing Aboriginal studies and medical students.
Employment created	• Modest employment potential but also provides opportunity to reinvigorate local culture and inform/educate broad community sectors.
Capacity to attract investors	• Public sector funding required.
Scale of impact	• Medium.
Skills available	• Training may add to existing indigenous knowledge of culture and sites.
Appropriate support infrastructure	• Curriculum development and "train the trainer" required.
Community/Government support	• Broad community/government support would be likely.
Government assistance required	• Assistance with infrastructure. • Support for the Cultural Heritage Centre.

The opportunity has obvious potential for synergies with existing and potential regional activities.

4.11 A LARGE SCALE INVESTMENT IN A REGIONAL CYPRESS MILL

The idea was raised at a consultation meeting that Aboriginal people should examine the opportunity to secure a supply of cypress sawlog and establish their own mill. The opportunity was contrasted to current investments in under performing broad-acre farms. Advice from SFNSW is that the sustainable yield of cypress in the BBSB is fully committed.

At the current time Aboriginal representatives are negotiating with the NSW Government to secure water resource entitlement as part of the Government's program of water reform. Potentially access to timber resource could be negotiated in the same way.

In the interim, the most likely opportunity for Aboriginal interests to enter cypress milling would be for the community to purchase an existing operation. Cypress mills are sold infrequently. Furthermore would be investors would need to consider whether this was the best use of investment funds. Cypress milling would need to be benchmarked against other investments with potentially higher commercial returns and capacity to offer higher employment levels for Aboriginal people. No immediate opportunity presents itself and the opportunity is flagged for future attention.

4.12 COMMERCIAL APIARY

Aboriginal people within the BBSB are understood to have expressed an interest in commercial apiary. Opportunities linked to apiary were reviewed in Chapter 4. Potentially further linkages might be established through bushtucker, plant nurseries and native bee honey production. Honey from native bees is believed to command "farm" prices of around $100 kg.

As with cypress milling, Aboriginal people could purchase an existing apiary operation. An alternative to this would be some form or cooperative arrangement or shared ownership with an existing apiarist. Commercial apiarists have expressed an interest in accessing lands owned by Land Councils for siting bees. Potentially some form of agreement could be reached between commercial apiarists whereby product is shared with Aboriginal people in exchange for provision of sites.

This opportunity could also be explored as a means by which Aboriginal people develop skills in apiculture by working with existing apiarists.

TABLE 4G APIARY FOR ABORIGINAL PEOPLE

Resource availability	• Industry is growing and requires labour • Training is needed and may be sourced through grants and CDEP • Accessible sites are in short supply and access to LC lands is potentially valuable to apiarists.
Markets	• Ample markets for product.
Employment created	• Small to Modest employment potential.
Capacity to attract investors	• Public sector training funding may be required.
Scale of impact	• Small to Medium.
Skills available	• Training required
Appropriate support	• Yes

infrastructure	
Community/Government support	• Broad community/government support would be likely. • LC support essential
Government assistance required	• Assistance with training.

An opportunity would seem to exist for a small number of aboriginal people to participate in the growing local apiculture sector. This opportunity should be pursued.

4.13 SITE ASSESSMENT CONSULTANCY SERVICES TO THE MINING SECTOR

Local Aboriginal people have undergone training in site recognition and have completed field surveys and reports for site assessments linked to mining sector/gas exploration EIS investigations. The opportunity to expand this activity is strictly limited. It is highly dependent on a small number of current investigations and the market for services would be quickly oversupplied with the provision of additional trained entrants. No further advancement of this opportunity is suggested.

4.14 PUBLIC SECTOR EMPLOYMENT LINKED TO THE WRA

An obvious group of opportunities for the BBSB Aboriginal community to arise from the Western Regional Assessment is public sector employment. Opportunities may exist in:

- SFNSW, roles might include ranger positions. SFNSW have examined the potential for a ranger in the Pilliga to manage picnic sites, work with school groups and so on. Indications were that the position would suit a local Aboriginal person. Potentially the same opportunity would exist in the Goonoo.
- NPWS, roles might include rangers and an Aboriginal education officer for local schools.
- Land Councils, employment could be generated in mapping and managing sites and an additional position to maintain scar trees in the BBSB has been mentioned.
- Planning NSW, the BBSB Assessment process has already generated a wealth of data that will be of value to both indigenous (eg cultural heritage studies) and non-indigenous populations (eg socio-economic profiling). Trained custodians who can provide access to and update this information will add value to future BBSB planning decisions. Training may involve GIS and database skills.

Outcomes in relation to Public sector employment will be driven by agency needs, budget constraints and, potentially, the negotiating priorities of indigenous representatives.

4.15 DATA MANAGEMENT BUSINESS FOR INDIGENOUS INTELLECTUAL PROPERTY

A linked opportunity involving Aboriginal custodianship of data pertaining to BBSB Assessment investigations is a stand-alone data management business. Data sourced from Aboriginal people, as part of the BBSB Assessment, would be returned to indigenous communities for their management. Subsequent use of this data, especially for commercial purposes would earn local indigenous communities a royalty fee for access to intellectual property. Data would be managed by local Aboriginal Land Councils and would include information on:

- Bushfoods and medicines
- Biodiversity

- Culture
- Community history
- Land management practices
- Conservation practices
- Sites and artefacts.

A review of the opportunity is summarised in the table below.

TABLE 4H DATA MANAGEMENT BUSINESS, INDIGENOUS INTELLECTUAL PROPERTY

Resource availability	• Data has been collected as part of the BBSB Assessment, some work on the data would be required to get it into a format suitable for use by Land Councils.
Markets	• Markets would include mining and gas exploration, local and state government, large farm developments and so on.
Employment created	• Modest employment potential, say ½ a full time officer in each of three Land Councils in the bioregion.
Capacity to attract investors	• Public sector funding and training would be required.
Scale of impact	• Medium.
Skills available	• Training required
Appropriate support infrastructure	• Yes
Community/Government support	• Broad community/government support would be likely. • LC support essential and likely to be forthcoming
Government assistance required	• Assistance with data processing, data management capacity and training required.

The opportunity is worthy of serious consideration.

4.16 ABORIGINAL INVOLVEMENT IN NATIONAL PARKS AND CULTURALLY SIGNIFICANT SITES

Aboriginal involvement in the management of national parks and culturally significant sites provides both an opportunity for Aboriginal people to have a say in management of country and employment potential. Employment and higher-level management potential may include everything from park management positions through rangers, heritage officers, site officers and park maintenance.

Terry Korn, NPWS Director, Western, outlined three types of arrangement that may be applicable to Aboriginal management of national parks in the BBSB. These arrangement types are summarised in the table below.

TABLE 4I OPTIONS FOR ABORIGINAL INVOLVEMENT IN NPWS ESTATE

Example	Implications
Mootwingee National Park	• Full Aboriginal hand-back under Section 14 of the national park Act • Aboriginal Board of Management established with representation from relevant Land Councils • NPWS lease back from Aboriginal community
Mungo National Park	• Co-management arrangement negotiated under a MOU with three Aboriginal nations and NPWS • NPWS provide assistance in meeting costs • Co-management arrangement is a two year trial
Kinchega National Park	• Aboriginal input into management without hand-back

In addition to National Park tenure other reserve categories under NPWS legislation include:

- Nature Reserves – limits access and sustainable use of resources as its primary focus is nature conservation
- State Conservation Area – new category, allowing broader use (eg mining)
- Regional Parks – more relevant for small urban areas
- Historic Sites – small areas, Aboriginal or European values linked to a person, event or historical theme
- Aboriginal Areas – only used where protection of Aboriginal culture is the primary purpose (see NPWS website for further details).

There is an opportunity for Government to negotiate with Aboriginal community representatives to determine arrangements that best suit the particular needs of the BBSB Aboriginal community. One of the areas open for discussion will be long-term sustainable employment opportunities offered under alternative management and tenure arrangements. Issues for consideration in regard to employment opportunities will include:

- The number and type of positions offered
- The period of employment being offered (is it a limited contract period)
- Opportunities for training and skill development
- The process by which positions will be filled
- And so on.

Feral Animal management under the Game Meat Act

The NSW Government has recently introduced the Game Meat Act as a means of productively controlling feral animals (goats, pigs, etc) on public lands. The question was raised at an opportunities workshop as to whether control of feral animals under this Act could be developed as an opportunity for Aboriginal people. Advice from NPWS is that opportunities will be tendered to all members of the public and Aboriginal people are welcome to apply.

4.17 CONCLUDING COMMENT – NON FOREST OPPORTUNITIES

Other worthwhile opportunities for economic development involving the Aboriginal community of the BBSB were uncovered as part of the investigation. For example a motel/conference centre at Narrabri on a key location controlled by the local Lands Council. Opportunities not linked to forest based industries were not considered in this study.

Review of the opportunities assessed would indicate a primacy for the Cultural Heritage Centre and then linking a package of activities (art/craft, education, tours, etc) around this priority option. Success with the Cultural Heritage Centre will provide a mechanism to develop "add ons" for the indigenous community.

5. PETROLEUM AND COAL OPPORTUNITY ASSESSMENT

5.1 INTRODUCTION

This chapter deals with the significance of oil, gas and coal in the region and presents information on development opportunities in the bioregion. A description of exploration activity is provided; the environmental, economic and social impacts of gas production and coal mining are reviewed; the opportunities are placed in context using the Multi-Criteria framework employed in other chapters and concluding comments are provided on the industry's concern with potential tenure changes.

5.2 OIL AND GAS POTENTIAL

Resource Potential

The BBSB is prospective for petroleum (both oil and gas). The northern portion of the bioregion contains emerging economic gas resources of State and possibly national significance. While not explored to the same extent, the southern part of the bioregion also has potential for yielding economic reserves. The whole BBSB remains under-explored when compared with petroleum provinces in other parts of Australia and the world.

The basins that underlie the BBSB are the same age and type as those producing major supplies of gas in Queensland's Surat/Bowen Basin. NSW, on the other hand, has no current significant indigenous supply of gas. Current sales of gas by state and basin are shown in Table 6A. The BBSB gas resource has the potential to change NSW's status as a net importer of natural gas from other Australian states.

New South Wales currently consumes approximately 130 petajoules (PJ) of gas per annum. This is expected to increase to 210PJ by 2020. Approximately 85% of this resource is sourced from the Cooper Basin in South Australia and 15% from the Gippsland Basin between Victoria and Tasmania. Gas reserves in the Cooper Basin are expected to be depleted over the next decade and the Gippsland Basin reserves will be exhausted by 2025. There is an increasing urgent need to locate additional gas reserves to replace these diminishing supplies. Gas reserves in the BBSB have the potential to supplement NSW's future requirements.

TABLE 5A GAS SALES BY STATE AND BASIN (MARCH 2001)

State and Basin	Production (mmcf/day)
Victoria - Gippsland	700
WA – Carnarvon	800
SA/Qld – Cooper/Eromanga	750
Qld – Surat/Bowen	50
Other	200
Total Production	**2,500**

Source: Australian Petroleum Production and Exploration Association web site

Exploration and Drilling Activity

Since the early 1980's four "wildcat" test holes targeting conventional petroleum have been drilled in the Pilliga region. Three of these test holes have generated gas flows at commercially viable rates. Similarly, a number of coal seam methane exploration wells have produced gas at commercially significant rates; a small number of these wells are currently on test production. At the current time there are eleven Petroleum Exploration Licences (PELs) in the bioregion held by a number of companies. PELs are held for the exploration of petroleum, which is defined as oil or gas and admixtures thereof.

Of those publicly listed companies actively involved in exploration and drilling in the BBSB, the most advanced is Eastern Star Gas Limited. Eastern Star Gas has a proven Conventional Gas field at Coonarah, to the west of Narrabri, and two further fields, Wilga Park (between Coonarah and Narrabri) and Bohena (to the southwest of Narrabri) under development. Eastern Star Gas also has a large number of prospective Conventional Gas targets in the BBSB. The company plans to bring Coonarah into commercial production shortly.

In addition to the Conventional Gas rights held by Eastern Star Gas, Coal Seam Methane (CSM) rights to the same PELs have been assigned to a US energy company (First Sourcenergy Group, Inc.). The US energy company has developed the CSM resource to trial production stage at Bohena. The US company and its partners have spent some $AUD37 million since early 1998 in the Pilliga.

While no oil strikes have been reported in the BBSB it is possible that the sedimentary strata that host gas resources in the BBSB, as well as coal, will also yield oil. Regional geology is consistent with productive fields in other parts of Australia.

Current exploration and commercialisation activity in the BBSB is focussed on the Pilliga and the area immediately to the north, and to an area to the north of Moree. Historically, exploration has concentrated on these areas. However, limited core hole drilling in the Tooraweenah trough northeast of Dubbo and seismic studies by Eastern Star Gas, indicate that this area is also prospective for oil and gas.

Exploitation of the Pilliga gas resource is yet to reach a commercial stage. Resource development has therefore entered a critical phase where major investments have been made and revenues from gas reserves are yet to be realised.

Exploration Expenditures

Exploration expenditures incurred in the BBSB since early 1998 by PEL are summarised in Table 5B. Dennis Morton of Eastern Star Gas provided these data. Expenditures associated with Eastern Star Gas and its US associate are accurate, other expenditures are order of magnitude estimates.

TABLE 5B OIL AND GAS EXPLORATION EXPENDITURE

PEL, Company and Nature of Expenditure	Exploration Expenditure ($'million)
PEL 238 – Eastern Star Gas and US Coal Bed Methane Partner. Includes Coonarah, Wilga Park and Bohena. Expenditure included 20 wells, 600 kms of seismic survey and trial production expenses.	39.0
PEL 433/434 – Eastern Star Gas. Expenditure includes 118 kms of seismic survey.	$0.5
PEL 6 – Eastern Star Gas. Area to the west of Moree running to the Queensland border. Expenditure includes two wells and 260 kms of seismic survey	$3.5
PEL 437/427/428/12/1/286/10 – held by other oil and gas exploration companies	~ $10
Total estimated exploration expenditure	**~ $53**

Source: Dennis Morton, Eastern Star Gas

Eastern Star Gas indicates that a significant part of exploration expenditure is incurred locally within the exploration area. Expenditure is incurred on local consumables, accommodation, meals and services. For example, expenditure into the local community whilst either a seismic or drilling crew is in the field is estimated at $10,000 per week.

Benefits to the BBSB community associated with exploration expenditure are minor compared to the positive environmental, economic and social impact of a gas development.

5.3 IMPACTS OF GAS DEVELOPMENT IN THE BBSB

In addition to exploration expenditure, environmental, social and economic benefits associated with commercial exploitation of gas reserves in the BBSB will include:

- An environmentally preferable fuel with a each production well having only a small environmental "footprint"
- Immediate economic activity associated with commercialisation of Coonarah
- Local electricity generation for sale to Country Energy, with ancillary benefits on supply stability
- The potential to lower the cost structure of industry and thereby facilitate major industrial investment eg. proposed ethanol plant at Narrabri
- Secondary industrial activity eg. more efficient energy use at Cargill Oilseeds plant at Narrabri and value adding to local agriculture products
- Potential production of new products eg. helium gas to displace current imports
- Potential economic activity associated with Bohena Conventional Gas and Bohena and Wilga Park CBM and similar developments in other PELs with natural gas being brought into production
- Contribution to social infrastructure eg. hospitals, roads, services, local indigenous knowledge

Each of these impacts is described below.

Environmentally Preferable Fuel with a Low Local Impact

Natural gas has a lower environmental impact than other fossil fuel based energy. When consumed it has lower carbon dioxide emissions than either diesel or fuel oil and half the carbon dioxide emission level of coal. Carbon dioxide is a major greenhouse gas.

Furthermore, resource recovery requires only a small field presence, with a surface footprint during the production phase typically consisting of a 5x5m square pad atop of each well. All gas gathering pipelines are buried.

Exploration and drilling normally results in minimal and temporary environmental disturbance. Seismic survey lines and pipelines are inspected by environmental scientists and local Aboriginal people and areas of significance, including any rare and endangered species/populations/communities, cultural heritage sites or bush tucker plants are bypassed or impact mitigation procedures implemented. A "put right" policy is maintained to restore disturbance in agricultural or other infrastructure. Compliance is monitored by the Department of Mineral Resources, who hold bonds from all licence holders.

Immediate Economic Contribution of Coonarah (PEL 238)

Gas from the Coonarah field will be piped to Narrabri and commercial production is anticipated to commence in June 2003. Proven and probable reserves are between 8.7 and 11.3 pedajoules (PJ) of energy. By way of comparison NSW's annual consumption of gas-based energy is estimated to total 130 petajoules.

Gas from the Coonarah field will be sold in Narrabri for industrial use and electricity generation. The project will directly employ four full time people on a permanent basis. An additional capital investment of $9-10 million is required to bring Coonarah into full commercial production and sales of Coonarah gas are estimated at $30 million over the life of the field.

Electricity Generation in Partnership with Country Energy

Commercial arrangements are in place between Eastern Star Gas and Country Energy, the regional electricity supplier, for use of some of the output from the Coonarah Gas field for the local generation of electricity.

The arrangement may involve the generation of electricity using twin, three-megawatt generators and connecting the resultant supply to the national grid. Combined the twin generators would produce enough energy to power more than 6,000 homes (Dennis Morton).

The advantages of this development would include lower cost electricity, electricity from a cleaner source and additional grid stability. Narrabri is towards the end of the delivery system and subject to disruptive fluctuations in supply.

Gas recovered from Coonarah and subsequent field developments that are surplus to Narrabri's requirements can be converted into additional electricity and fed into the grid for use in other locations.

Potential Ethanol Plant Development

Eastern Star Gas is currently in discussion with several developers of proposed ethanol plants to be based in either Narrabri or the surrounding district. A typical plant will have a capital cost of

$55 million and operating costs that are driven by the price of energy. Some 40% of total operating costs will be for gas and the presence of the Coonarah and Bohena supply has a major influence on location decision. The plant could buy gas from Coonarah and other fields expected to be developed at the rate of 1.6 PJ/year, and ramp up consumption to 3.2 PJ/year in subsequent years. The proposed plant will produce 60 ML of ethanol per annum rising to 120 ML in three years time (Mathew Kelley).

During construction the plant will employ 450 people. When complete it will have a permanent workforce of 34. Additional linked industrial activity in the transport, chemical and trade sectors is expected to generate a further 180 jobs (Dennis Morton & Narrabri Courier).

The proposed ethanol plant will produce major economic opportunities for sorghum and corn growers (150,000 tonnes per annum for initial production), feedloters (50,000 tonne of high protein cattle feed known as "distillers grain") and the industrial sector (60,000 tonne of carbon dioxide for uses in processes such as frozen food production). The development has potential to locally value-add to primary products.

Impacts on Existing Industry eg Cargill Oilseeds at Narrabri

In addition to the "large ticket" impacts associated with Coonarah, subsequent impacts will include process efficiencies and energy cost savings to local industry. For example a local supply of gas will permit the Cargill oilseeds crushing plant at Narrabri to displace coal consumption. Gas can be used for co-generation of electricity with the heat by-product used to power the plants' boilers.

Other Products eg helium

Testing from commercial wells in the BBSB would indicate that the gas recovered at Coonarah is high in helium and this potentially adds additional economic value to the natural gas find.

Australia is a net importer of helium from the United States. The gas is a high priced resource (US$56 per 1,000 cubic feet) and a proven locally available separation process means that helium can be recovered and marketed separately for a premium price (Dennis Morton).

Other Conventional Gas Reserves on PEL 238

In addition to the existing commercial development of Coonarah, PEL 238 contains more than 9,000 square kilometres of prospective licence. This includes a large number of known but yet to be drilled prospects. The largest prospects in PEL 238 are as yet un-drilled. It is possible that PEL 238 will aggregate well over 200 PJ in Conventional Gas reserve with a gross gas value of over $600 million. New seismic surveys together with appraisal and development drilling are planned for PEL 238 in the immediate short term.

Bohena is a Conventional Gas Field in PEL 238 that currently consists of four wells each with conventional gas flows at commercial rates. The Bohena Field has a possible gas reserve of between 10 PJ and 15 PJ. Further appraisal drilling is planned for this field late in 2002.

A new untested structure has been located in PEL 238 at Newell to the south west of Bohena. Exploration drilling is also planned for the Newell Prospect.

Wilga Park also has known conventional gas above Coal Seam Methane reserves. The size of this reserve is undeclared.

Coal Seam Methane: Bohena and Wilga Park (PEL 238)

In the thick early and late Permian coals that underlie the conventional gas bearing sandstones of PEL 238 lie coal seam methane resources and reserves in excess of 17 Trillion Cubic Feet (Dennis Morton).

To place this resource in context it is nearly three times larger than the Cooper/ Eromanga Basin Reserve of Queensland (assessed at 6.5 Trillion Cubic Feet). The Cooper/Eromanga Basin Reserve currently supplies more than 30% of Australia's total natural gas sales (Hassall & Associates assessment based on data supplied on the Australian Petroleum Production and Exploration Association website, March 2001 data).

It is predicted that the size of this resource will expand with continued exploration and testing (Kim Wright). A pilot production program is currently in progress and an expanded assessment program is planned for the next twelve months (Dennis Morton).

Additional Conventional and CSM Reserves (eg PEL 434, PEL 6)

PEL 434 lies to the west of PEL 238. Both exploration licences hold potential for Conventional gas and Coal seam Methane production. Importantly their potential for petroleum production has recently been upgraded. These resources are close to the major regional centre of Dubbo and the existing gas pipeline. Further seismic investigations are planned (Dennis Morton).

PEL 6 is located in NSW to the south of the border at Goondiwindi. The 260 km Whalan Creek seismic survey was recently recorded entirely within this licence area. While further seismic investigations are planned for PEL 6, exploration to date has yielded a prospect with reserves potential of 140 PJ. Drilling success would value this single prospect at $420 million.

Other PELs within the bioregion that have not been reviewed here include PEL 428, PEL 12, PEL 1, PEL 286, PEL 10, PEL 427 and PEL 437. However all are prospective, to a greater or lesser degree, for coal seam methane and/or conventional gas.

Overall Scale of the Oil and Gas Opportunity

The overall scale of BBSB oil and gas fields including their potential size and an approximate worth is summarised in Table 5C.

TABLE 5C PROVEN, PROBABLE AND POSSIBLE GAS RESERVES AND RESOURCES

Gas Field and Comment on Status	Reserves and estimated value
PEL 238 Conventional Gas	
Coonarah – proven and probable reserves	8.7 to 11.3 PJ ($30 million gross sales)
Wilga Park	??
Bohena – conventional gas field	10-15 PJ ($40 million in gross sales)
Newell	??
Other structures	??
Total Conventional Gas, PEL 238	**200 PJ** **($600 million plus gross sales)**
PEL 238 Coal Seam Methane	
Bohena and Wilga Park and more than 15 others	
Total Coal Seam Methane, PEL 238	**17 Trillion Cubic Feet** **(>$1 billion gross sales)**
PEL 433/434 Conventional Gas and Coal Seam Methane with potential for petroleum	??
PEL 6 Conventional Gas	**140 PJ** **($420 million plus gross sales)**

Source: Hassall & Associates estimates from various sources

Contribution to Regional Services and the Community

In addition to the economic benefits associated with oil and gas development described above, the opportunity provides potential for the bolstering of regional services and community infrastructure, for example:

- Oil and gas exploration contributes to the understanding of local environmental resources through cultural heritage, fauna and flora surveys.
- It provides for an alliance with the Pilliga Forest Aboriginal Management Committee for cultural heritage work. Cultural heritage work provides new skills and a revenue source to the local indigenous community.

The jobs created in the sector also help to underpin community infrastructure such as medical services, schools, police and justice.

5.4 COAL POTENTIAL

The following section on the potential of coal in the bioregion is reliant on material supplied by the Department of Mineral Resources.

Coal was discovered in the Gunnedah area in 1877. The Centenary (Preston) Colliery at Curlewis commenced production of coal in 1889. Coal mining at Gunnedah commenced in the 1890s and the Gunnedah Colliery and Black Jack Collieries were opened soon after. These mines produced coal for the railways and local industry, including the Tamworth power station. Coal production dropped considerably in the 1960s due to the railways converting to diesel locomotives and to the closure of the Tamworth power station following expansion of the State Electricity Grid. In 1984, an expansion program commenced at Gunnedah Colliery that included development of open cut pits to mine the Melvilles seam.

Over the years, these mines made a significant contribution to the local economy. For example in 1986, Gunnedah Colliery employed 281 people and produced 800,000 tonnes of coal. In the same year, Preston Extended Colliery employed 63 people and produced 200,000 tonnes of

coal. Preston Extended Colliery was finally closed in 1998 and Gunnedah Colliery in 2000. Both of the closures were due to depletion of reserves.

In the Boggabri - Maules Creek area, coal was discovered early this century during water drilling operations. In 1971, Sunshine Gold Pty Ltd conducted a reconnaissance-drilling program in the vicinity of the Vickery State Forest**.** In 1985, Vickery Coal Pty Ltd was granted a Coal Lease for the Vickery mine, and limited production commenced. At its peak this operation employed 60 people and produced 800,000 tonnes of coal. Vickery Mine closed in 1998 when the reserves were exhausted. The nearby Whitehaven Mine commenced production in 2000. It currently employs 36 people and produces 400,000 tonnes annually. A second open cut mine, the Belmont proposal, which is located 10 km to the east of Whitehaven is due to open shortly.

Exploration Permit Tender Area No. 1 covering an area to the north of Vickery was awarded to a joint venture comprising BHP Minerals Ltd and AMAX Pacific Inc in 1975. A trial box cut into the Merriowen seam was constructed in 1979. In 1990 the Joint Venture was granted Coal Lease 368 but mining has yet to commence. In 1980, Pacific Coal Pty Ltd was granted Exploration Permit Tender Area No. 4 in the Maules Creek area. A Coal Lease was granted in 1991 but mining is yet to commence.

The Department of Mineral Resources has maintained a strong involvement in resource assessment of the basin since 1974. Thirteen major programs have been completed with 186 boreholes being drilled and geophysical surveys being recorded. These programs have provided the framework for understanding the regional geology and the energy resources. The drilling results indicate that the basin contains substantial resources of open cut and underground coal suitable for use as both a domestic and an export thermal coal, or as part of a soft coking coal blend. Three areas, the Narrabri, Breeza and Caroona areas have been assessed in detail for future development in the short to medium term.

The recovery of the basin's coal resources on a significant scale will commence in the in the medium to long term. There are extensive resources in the Hunter Coalfield and the Northern Western Coalfield that are, at present, a lower cost option. The Hunter Coalfield is currently New South Wales's most important coalfield producing 60% of the 110 million tonnes of saleable coal in 2000-01. Approximately 85% of this production is by high volume low cost open cut operations. Ulan Mine located 25 km East of Gulgong in the Northern Western Coalfield is an open cut and underground mine which produced 6 Mt saleable coal in 2000-01, representing approximately 5.4% of the State's total production.

The future of the Gunnedah Coalfield is dependent on the cost of mining and transport to market becoming competitive with operations in the Hunter Valley and Western Coalfield. Future coal mining in the Gunnedah Coalfield will be dependent on:

- Depletion of coal reserves amenable to open cut mining in the Hunter Coalfield over the next 20 years.
- Increasing costs of mining in the other coalfields associated with the increasing level of production from underground mines.
- Changes to rail transport infrastructure that will reduce the cost of transport to domestic coastal markets, and to the Newcastle coal terminals for export.
- Availability of markets that are beyond the maximum production capacity of the Hunter, Western and Newcastle Coalfields to fulfil.

The substantial coal resources of the Gunnedah Coalfield will be required at increasing levels over the next few decades to replace diminishing production from the other coalfields. In the interim it is essential that these resources remain available for exploration and mining when

required and are not sterilised by incompatible landuses. In the long term, (30-50 years), they represent the State's last major strategic coal resource.

5.5 OVERALL OPPORTUNITY ASSESSMENT

A major opportunity for the BBSB is the discovery of substantial gas and oil reserves in the bioregion. Coal from the BBSB will remain an important long-term resource for NSW. Broad details of the opportunity are presented in the table below.

TABLE 5D GAS, OIL AND COAL MINING

Resource availability	• First commercial gas field in NSW further exploration underway • Eastern Star Energy describe the resource as significant • Proven and predictable yields anticipated • Coonarah field expected to yield between 8.7 and 11.3 petajoules of energy compared to a NSW annual total use of 151 petajoules • Future exploration in the Bohena and Wilga Park prospects are expected to significantly add to this reserve • Coal available to meet the medium and long-term needs of NSW and export. New developments will occur with increasing frequency as reserves in the Western and Hunter Coalfields are exhausted.
Markets	• Eastern Star Energy anticipate local use of gas reserves • A pipeline is planned to deliver gas to Narrabri • Eastern Star Energy have joined with Country Energy to develop natural gas markets in the region • Energy to power local industry including cypress and hardwood mills.
Employment created	• Substantial during both exploration and operation and linked industrial opportunities. • Estimated by Eastern Star Gas at 250 new jobs including direct, in services and in new industry. • Direct and indirect employment opportunities associated with development of new coalmines over the next 30 years.
Capacity to attract investors	• Commercial opportunity. • Eastern Star Energy listed on the Australian Stock Exchange.
Scale of impact	• Large.
Skills available	• Yes.
Appropriate support infrastructure	• Infrastructure is adequate
Capacity to create opportunity for the Aboriginal Community	• Potential for roles in addition to EIS consultancies.
Community/Government support	• Support from government. • Conservation interests have called for cessation of exploration in the Pilliga.
Government assistance required	• Nil in addition to appropriate land tenure • Current State Forest or Crown Land title preferred to the unknown operating environment associated with NPWS State Conservation Area title or changes to SFNSW Forest Management Zones. • An approval process linked to an agency established for resource development (DMR or SFNSW) preferred to one established for conservation (NPWS)

Gas, oil and coal are a major economic opportunity in the bioregion with significant potential to boost the regional economy.

5.6 CONCERNS ASSOCIATED WITH TENURE CHANGE

The coal and petroleum sector is concerned by possible tenure changes as a result of BBSB assessments and resultant negotiations.

Under current Crown Land and State Forest tenure, approval for PELs and their subsequent conversion to Production Leases (PLs) is controlled by the Department of Mineral Resources, an agency established for the purposes of facilitating responsible resource development.

Under possible changes in tenure resultant from a Western Regional Assessment in the BBSB, approval for conversion of PELs to PLs may change from the DMR to the National Parks and Wildlife Service or be subject to reclassification under State Forest's system of Forest Management Zones.

While this change in tenure will not necessarily sterilise the coal and petroleum production potential of the BBSB, approval for resource development will be shifted from an agency with a focus on resource development to one with a focus on flora, fauna and heritage conservation or an inappropriate State Forest arrangement. Furthermore, the approval process and the operating environment proposed for these changed tenure arrangements are unknown; the tenures are relatively new, and therefore a further commercial risk to investors. Conversion of a PEL to a PL under NPWS control is as yet unattempted by the mining industry.

The proposed NPWS State Conservation Area category allows for exploration, mining and quarrying activities, with revised and in some cases, additional restrictions. State Forest's Forest Management Zone 1 excludes all future mining, quarrying and exploration activities. Forest Management Zones 2-3 exclude all future quarrying activities and place restrictions on mining and exploration activities.

Exploration Licences and Mining Leases and other various mining, exploration and quarrying licences and permits cannot be granted in pre-existing National Parks, and in some other forms of "conservation" tenure including Forest Management Zone 1 and Nature Reserves. Changes in land tenure to various forms of conservation reserve effectively sterilises future mining, mineral and construction material potential. Approximately twenty five percent of the Pilliga forest is under a nature reserve title and this sterilises future exploration and mining activity. The industry proposes a ten to fifteen year moratorium on the sterilisation of exploration rights to allow a comprehensive exploration program in the BBSB.

The economic activities described in this report are potentially at risk from an unsympathetic change in land tenure. However it should be noted that The Department of Mineral Resources has recently identified highly prospective mineral and petroleum areas of the Bioregion outside all of state forests and conservation reserves.

5.7 CONCLUDING COMMENT ON COAL AND PETROLIUM

The BBSB contains emerging economic gas resources of state and seemingly national significance. If proved economic, there is potentially sufficient resource to supply NSW's gas requirements for a number of decades. Coal exploitation would seem to provide potential for the long term. The social and economic benefit for the BBSB community associated with gas development is an order or magnitude greater than opportunities assessed in other chapters of this report.

6. RANKING, SYNERGIES AND NEXT STEPS

6.1 INTRODUCTION

This chapter draws together the results of the multi-criteria analyses completed in Chapters 3, 4 and 5. Forest based development opportunities, opportunities for the Aboriginal community and oil and gas are ranked as either "high" or "medium" in importance. Opportunities ranked low or rejected in the multi-criteria analysis are not recorded here. Results are presented in a simple summary table that includes suggestions for "next steps" and synergies with existing or new industries and activities. A separate chapter section deals with overarching actions required to achieve opportunities.

6.2 PREFERRED OPPORTUNITIES

Table 6A provides a summary of forest based opportunities and opportunities for the Aboriginal community of the BBSB.

TABLE 6A: PREFERRED OPPORTUNITIES

Opportunity	Synergies	Next steps
High Importance		
Gas and Mining	• Lower cost, more reliable energy to power local industry including cypress and hardwood mills	Commercial opportunity that is preceding at the current time
Cypress: Lamination plant to add value to lower grade timbers	• Links with existing value adding/market focussed cypress mills • Links with supplementary cypress thinning proposal • Links with co-product utilisation • Links with additional ironbark harvesting	Commercial opportunity requiring resource security from a negotiated BBSB Assessment to proceed.

Cypress: Supplementary thinning of regrowth as per *Friends of the Pilliga* proposal	• Links with lamination plant, marketing, cypress oil and briquette manufacture • Also has links to Aboriginal employment through CDEP	Government assistance required as outlined in this report.
Hardwood: Further processing of emerging ironbark resource	• Links to existing ironbark mill at Baradine, cypress mills and coastal mills • Integration potential with cypress mills • Waste also available for firewood	Commercial opportunity dependant on BBSB Assessment outcome and change to SFNSW Harvesting Plan of Operations to permit integrated harvesting in the Pilliga.
Firewood harvesting from greenwood thinnings and under utilised species	• Links to existing BBSB firewood industry • Links to Aboriginal CDEP firewood harvest. • Links to further processing the ironbark resource.	Requires a strategic plan similar to CISP and an appropriate "phase in" period to gain market and operator support.
Apiary: Growth on the back of demand for honey, locally branded product, packaged bees and pollination services	• Links to ironbark harvest, negative (less floral resource) and positive (resource access) • Linked to forest based tourism (minor) • Linked to Aboriginal opportunities including employment potential and access to Land Council sites	Requires continued access to current and new apiary sites (roads). R&D, training and extension also important.
Tourism and Aboriginal Development: Pilliga Cultural Heritage Centre, Baradine	• Linkages to Aboriginal community (retailing, arts/craft, chance to tell story, etc) • Camp Cypress • Regional Tourism Organisation • Tours and eco-tourism • Product branding	Government funding required to capitalise on community support. A tangible community backed outcome of the BBSB Assessment process
Medium Importance		
Cypress: Follow the Queensland industry into the USA market to complement Japanese exports.	• Linkages as per lamination plant • Links with Queensland industry to maximise Australian resource potential	Consideration of the opportunity by the CISP.
Cypress: Co-product utilisation – cypress oil	• As per lamination plant • May link in with other regional branding activities	Commercial opportunity. Scale of opportunity is secondary to maximising mill timber harvest and value.
Cypress: Co-product utilisation – briquette manufacture	• As per lamination plant • Links to existing BBSB firewood industry • Links to regional grains industry	Potential commercial opportunity currently under consideration by a regional mill.
Co-generation of electricity from forest by-products – gasifier for mill power use	• May have to compete for waste with other opportunities (eg briquettes	Emerging commercial opportunity.

Mill waste utilisation to part fuel an ethanol production plant	• May have to compete for waste with other opportunities (eg briquettes • Links to regional grains industry • Links to gas exploration	Reliant on decision to proceed with ethanol plant and location of the plant within an economic deliver zone for mill waste.
Regional Tourism Organisation to coordinate marketing and branding of the bioregion	• Linked to Camp Cypress, Cultural Heritage Centre and private tourism businesses • Build additional government linkages eg between local government and NPWS	Meeting between local government authorities and other interested parties to review proposal and merits of forming a separate entity to promote the region.
Aboriginal: Art and craft of the Region, production and retailing	• Links to Cultural Heritage Centre and existing CDEP outputs	Requires "go-ahead" for the Cultural Heritage Centre and continuing support with CDEP funds.
Aboriginal: Bushfoods and medicines and seeds for local revegetation	• Links to Cultural Heritage Centre (retail opportunity), tours (eco tours, cultural heritage tours), CDEP programs (harvest labour), SFNSW (potential markets for seeds, license fees/access to resource)	Requires "go-ahead" for the Cultural Heritage Centre and continuing support with CDEP funds.
Aboriginal: Greenwood firewood industry	• Would benefit from the establishment of links with existing commercial firewood industry players	Needs a firewood strategy like CISP and continuing support with CDEP funds.
Aboriginal Cultural heritage tourism – cultural education and tours	• Links with Camp Cypress, the Cultural Heritage Centre and Regional Tourism Organisation functions associated with upgrade of infrastructure (maps and roads)	Requires "go-ahead" for the Cultural Heritage Centre and continuing support with CDEP funds.
Aboriginal studies incorporating modules for school groups, tertiary training and learning for Aboriginal youth	• Links to Cultural Heritage Centre and Camp Cypress	Requires "go-ahead" for the Cultural Heritage Centre, market research and content development.
Aboriginal: Commercial Apiary	• Links with existing apiarists and Land Councils • Links with CDEP to provide training	Simple get together required between interested Aboriginal people and apiarists
Aboriginal: Public sector employment and involvement in the management of the Service estate	• Links to Aboriginal studies and cultural heritage tourism • Links to greenwood firewood and bushfoods, medicines and seeds	BBSB Assessment negotiation outcomes

From the table it can be seen that five of the seven highest ranking opportunities for forest industry development require limited government assistance outside of resource security to ensure private sector investment. The outcome of BBSB Assessment negotiation is critical to planned investment decisions. The two priority options requiring government assistance are the Supplementary Thinning of Cypress Regrowth and the Cultural Heritage Centre at Baradine.

Of the fourteen identified medium priority options four are directly linked to the Cultural Heritage Centre at Baradine and provide economic development opportunities for the Aboriginal community of the BBSB. The Cultural Heritage Centre is viewed as a catalyst for a

suit of economic development opportunities. Furthermore five opportunities are linked to the thinning of cypress regrowth and utilisation of forest waste. Government investment in cypress thinning and the Cultural Heritage Centre will potentially have spin-off benefits for medium priority opportunities.

6.3 OVERARCHING ACTIONS

The following overarching actions to achieve priority opportunities have their origin in stakeholder consultation in the BBSB.

1. Maintenance of existing resource allocations with long-term security following the BBSB Assessment negotiations.
2. Maintenance of existing SFNSW management of the forest resource to ensure access for industry development and employment creation.
3. Investment in forest industry R&D to ensure maximum product values.
4. Review of SFNSW Plan of Operations for the Pilliga to permit integrated harvesting of cypress and ironbark and hence access to the emerging ironbark resource.
5. Provide continued opportunity for Aboriginal involvement in decision-making and employment in BBSB forests. Set and deliver on Aboriginal employment benchmarks.
6. Resource security is preferred to structural adjustment assistance; the cypress industry underwent a major restructure in 1996.
7. Co-brand products originating from the bioregion to secure profile for the region and add value to individual marketing dollars.
8. Develop the Pilliga Cultural Heritage Centre.

Study conclusions mindful of these community comments are developed in the final report chapter.

7. STUDY CONCLUSIONS

Priority opportunities for expansion of existing and new forest based industries include (not in priority order):

- Gas and mining exploration and development
- A lamination plant to add value to lower grade cypress timbers
- Supplementary thinning of cypress regrowth as per the *Friends of the Pilliga* proposal
- Further harvesting and processing of the ironbark resource previously believed to be "sub-economic"
- Firewood harvesting from greenwood thinnings and under utilised species
- Apiary growth linked to market demand and continued access to BBSB sites
- The Pilliga Cultural Heritage Centre

Medium priority opportunities for expansion of existing and new forest based industries include (not in priority order):

- Export marketing of cypress to the USA through the CISP and links with the Queensland industry
- Cypress co-product development – cypress oil production and marketing
- Cypress co-product development – briquette manufacture
- Co-generation of electricity using gasifiers to power regional mills
- Mill waste utilisation as part fuel for an ethanol plant
- A regional tourism organisation to separately market the bioregion
- Aboriginal arts and craft of the region – production and retailing
- Aboriginal bushfoods, medicines and seeds for local revegetation
- Aboriginal owned, greenwood based firewood industry
- Aboriginal cultural heritage tourism – cultural education and tours
- Aboriginal studies incorporating school groups through to tertiary training
- Aboriginal participation in commercial apiary linking access to Land Council sites in exchange for product or training
- Aboriginal intellectual property management
- Aboriginal public sector employment and involvement in the management of the NPWS estate

All options evaluated present opportunities for synergies they build on existing industries rather than attempting to create new or high risk activities.

8. STUDY REFERENCES

Aurora Practical Solutions Pty (2001) *Pilliga Cultural Heritage and Timbercraft Centre Business Case*.

Myers Strategy Group (1996) *Strategic Plan for the Cypress Industry*.

Pilliga Economic Development and Tourism Committee *Minutes, Inaugural Meeting 5 March 2002*

RACD, CARE, EBC (2000) *Economic & Social Assessment for the Brigalow Belt South*, NSW Western Regional Assessments, Stage 1 Report.

Tayner, Richard (1999) *Value Adding in regional Communities and farming industries,* Regional Australia Summit.

The Proteus Management Group Pty Ltd (1999) *Forest Based Industries Development Opportunities, Southern CRA Region*. A project undertaken as part of the NSW Comprehensive Regional Assessments

Timby Rural Consulting (1999) *Pilliga Timbercraft Feasibility Study*.

Williams, Mike (April 2001) *Report on Meeting to Establish Goonoo Forest Aboriginal Management Committee*

Williams, Mike (March 2002), *Community Stakeholder Workshop Moree NSW Workshop Two of a series of Community Stakeholder Workshops for the NSW Western Regional Assessments*.

9. PERSONS CONSULTED AS PART OF THE STUDY

Name	Affiliation/Interest
Ainley, Russ	Forest Products Association
Allen, Claire	NPWS – Aboriginal Issues
Andrew, Heather	Gwabegar/Pilliga Community Link
Baskerville, Bruce	NSW Heritage Office
Baulch, Andrew	Pilliga Cultural Heritage Centre – Fund raiser
Brennan, Patrick	Brennan Logging
Burns, Will	Goonoo Forest Aboriginal Management Committee/Wirrabah Direct Descendants Corp
Chatfield, Joan	RACD, Planning NSW
Clancy, Fred	Coonabarabran Shire Mayor
Colquhoun, Venita	Narrabri, Coonabarabran, Coolah Regional Vegetation Committee
Crawford, Evelyn	Manager Cultural Heritage Western Regional Assessment, PlanningNSW
Crowe, Justin	Senior Forester, State Forests Baradine
Cutts, Liz	Baradine Progress Association
Dench, Max	Forest Products Association
Farley, Rick	RACAC Chair
Featherbe, Rebecca	Baradine Progress Association
French, Tom	Moree Aboriginal Lands Council
Harding, Jane	Baradine Progress Association
Harper, Peter	Institute for Foresters of Australia, NSW Division
Hayman, Ted	Baradine Progress Association
Ingraham, Yvonne	Aboriginal Liaison Officer, NSW Planning Dubbo
Irvine, Ross	State Forests (Sales Manager) – Dubbo
Johnston, David	Baradine Progress Association
Lee, Arthur	Aboriginal Representative, Mudgee
Linehan, Marty	State Forests Baradine, Pilliga Econ Dev & Tourism Committee
Lord, Christine	Timbercutters and Firewood Collectors/Goonoo Action Group
MacLeod, Marion	Tourism Manger Narrabri Shire Council
Mathews, Roy	Gallagher Timbers Baradine
Maxwell, Bronwyn	Mudgee
McDonald, Neil	Baradine Progress Association
Merit, Neville	Gilgandra Local Aboriginal Lands Council
Morton, Dennis	Petroleum Exploration Society of Australia
Neirinckx, Amanda	RACD, PlanningNSW
Noble, Ric	RACD, Planning NSW
O'Grady, Carl	Toomelah Local Aboriginal Land Council
Paul, George	Baradine Sawmilling and Gunnedah Timbers
Paull, David	Eco-tourism, Native Conservation Council, NPA rep on RACAC, NPA Woodlands Officer.
Ramien, Max	Ramien's Timber (Sawmill owner) – Dubbo
Ryan, Rebecca	Coonabarabran Shire, Tourism NSW Newell Hwy Group
Ryan, Steve	Dubbo Local Aboriginal Lands Council
Smith, Craig	CFMEU Representative

Still, Tim	RACD NSW Planning, Team Leader Western Regional Assessment
Streeter, Susan	NSW Minerals Council
Stuart, Cate	Country Women's Association, Beresford Park Narrabri
Sunderland, John	Apiarists
Trindall, Eddie	Pilliga Forest Aboriginal Management Committee
Trindall, Lyn	Wiawa CDEP Narrabri
Underwood, Tom	Forest Products Association
Weis, Bill	NSW Apiarists Association
Wells, Paul	SFNSW
Welsh, James	Coonamble Aboriginal Land Council
White, Cameron	NSW Heritage Office
Williams, Mike	Facilitator
Wright, Kim	NSW Minerals Council
Young, Rod	NSW Farmers Coonabarabran

Appendix 1: Southern CRA Forest Based Industries Development Opportunities (Brooks and Gibbs 1999)

Major investments (>$5 million)

- Hard and soft wood plantations
- Plantations for carbon sinks

Small to medium (10-100 employees)

- Dryland salinity rehab
- Effluent disposal
- Farm forestry for carbon sinks
- Plantation research
- Veneer and plywood mill
- Charcoal manufacture for silicon (already rejected for BBSB)
- Biomass energy generation
- Nursery plantations and Christmas trees
- More mobile mills
- Tea tree plantations
- Specialty turpentine
- Health spa in forest
- Exclusive camp sites for ecotourism
- Wood briquettes
- Bushfood
- Native cut flowers and foliage (long way from market)

Small (10-20 employees)

- Drying plants and kilns
- Moulding and dressing plants
- High quality furniture
- Seed collection
- Car based forest tourism
- Off road tourism in state forests
- Horse recreation in forests
- Nature trails
- Forest education tours

Government Infrastructure

- Road upgrades through the forest
- Updates SFNSW maps following BBSB Assessment

Appendix 2: Opportunities for the Aboriginal Community in Forest Based Industries (Workshop 22 March 2002)

Cultural Heritage Centre and Community Forest

- Museum space/keeping place
- Gallery
- Sale of crafts (tools and weapons) and art (paintings). Would provide an outlet for sale of Aboriginal art produced in Narrabri which currently does not have an outlet in the town. Work up an art of region theme (Andrew)
- Local produce (honey, jams, etc), website for Centre
- How will Aboriginal people benefit (chance to tell their story – very important, employment in centre – Andrew to provide estimates of numbers, making products)?
- This should be a marketing vehicle for other activities i.e. visitors come into Centre and be directed to other opportunities (Andrew Baulch, Fundraiser)
- Perhaps centre would be better located at Narrabri
- Centre is an important focus for local Aboriginal community (Marty Linehan)

Cultural Heritage and Tourism

- Preference for access to dance, music and language before access to sites – staged process is proposed where visitors would be introduced to the culture first, with interpretation and learning and then, if appropriate provided access to a site with an Aboriginal guide (this is not done elsewhere and is potentially very valuable to both Aboriginal people and the visitor)
- Capture some of the Aboriginal Tourism opportunities that now exclusively NT
- Link to Wentworth to Bourke Aboriginal Heritage Trail (Evelyn has details)
- Link to proposed Dubbo, Narromine, Nyngan, Bourke, Brewarrina, Walgett, Narrabri, Pilliga, Warrumbungles, Gilgandra and Dubbo loop (Andrew has details)

Tours

- Linked to cultural heritage centre
- Community Forest tours, Pilliga forest tours and cultural heritage sites
- Bird and koala based tours
- Heritage education tours
- Single site tours (if Minnom Mission is proposed need to talk to Pilliga Lands Council). Better opportunities might be Wooleybah Mill and the Aloes (take ministers here to show them lots of koalas)

Education Opportunities

- Linked to cultural heritage centre
- Links with Macquarie University Aboriginal Studies classes – add variety over standard trip to Northern Territory/Uluru
- School kid visits
- Cultural training from elders for young Aborigines (to work people would need to come to elders – otherwise experience would be out of context)

- Language camp linked to Camp Cypress at Show ground (Coonabarabran schools already teaching)
- Doctor training in understanding rural communities

Products from the Forest

- Bush foods and medicines
- Native cut flowers and foliage (long way from market)
- Firewood collection (utilise bulloak, based around recovery of greenwood forestry operation by-products)
- broombush cutting
- didgeridoo timber harvesting (Marty has info on Yass based business that employs two local people to find hollow bloodwood branches)
- seed collection for nurseries and bush tucker
- nursery establishment

Timber Milling

- Aboriginal owned mill in the bioregion
- work opportunities in existing mills
- sawing
- transport

Public Sector Opportunities

- Contract with SFNSW for thinning and management of the forest
- Establish a nursery to provide SFNSW seedlings
- SFNSW has discussed need for a ranger for Pilliga forest to manage picnic sites, school groups, etc). Ideally this would be an Aboriginal person (Marty)
- Employment opportunities with NPWS and in any new National Parks
- Training in computer use, GIS training would link in wit current consultancy opportunities
- Work as keepers of the data generated by socio-economic assessments

Consultancy opportunities

- For gas exploration/mining companies, etc as part of EIS and approval process
- Limited number of high value opportunities
- Registered consultants required

Commercial Bee Keeping opportunities

- link to bush tucker

Outputs from CDEP Groups

- what are the products (Lyn Trindall has a list)

Wooleybah Mill

- tourism visits and interpretation

Mission, Grazing and Timber Industry Linked History and Conservation

- Minnom Mission interpretation and visits
- Aboriginal/white history entwined
- Employment in mines

Camp Cypress Links

- Employment in the proposed camp

Mill waste

- For artefacts?
- Co-generation of electricity from mill waste (could be supplemented with harvesting of bulloak – an under-utilised pest species
- NSW has a current policy of 5% green energy, currently some Cypress waste goes to Lidell Power Station, bullock plus Cypress thinnings would be input, transport cost has been killer in past (Marty)
- extraction of oil for its antiseptic properties