

NSW WESTERN REGIONAL ASSESSMENTS

Nandewar

Development Opportunities in the Nandewar Bioregion

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NAND12



RESOURCE AND CONSERVATION ASSESSMENT COUNCIL

Nandewar

Development Opportunities in the Nandewar Bioregion

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INFORMATION

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Project Summary

This project was part of a group of projects aimed at providing a better understanding of socio-economic attributes and activities on public and private lands in the Nandewar Bioregion.

The objective of this study was to provide an analysis of forest based industry development opportunities with a focus on existing and potential forested land use strategies for the Nandewar. The study also examined, Aboriginal development opportunities, minerals, construction materials and petroleum opportunities, and conservation opportunities on private and public land holdings

The study included both desk based research and consultation with industry and community members. Opportunities were ranked on the basis of evaluation criteria which included resource availability, markets, employment, capacity to attract investors, scale of impact, supporting infrastructure, capacity to create opportunities for the Aboriginal community, government/community support and government assistance required.

The high priority development opportunities include:

Forest Based Industries

- High priority opportunities include:
 - Further processing of cypress timber, especially pre-finishing of product for export markets;
 - Supplementary cypress thinning consistent with the Red Chief LALC business case; and
 - Tourism and recreation – new camp grounds fronting the McIntyre and Gwydir Rivers.
- Of medium priority were opportunities for silviculture; commercial apiary; utilisation of cypress by-products; and tourism opportunities for maps and guides, walking and access tracks and collaborative tours.
- Other opportunities identified but assessed to be of low priority include: hardwood and other native timber products; plantations, woodlots and agroforestry including effluent irrigated woodlots; renewable energy industries – wind farms; apiary – native bees; grazing, including the harvesting of native meats; development of a regional tourism strategy; and integrated natural resource management.

Aboriginal Development

- High priority opportunities include:
 - Supplementary cypress thinning;
 - Public sector employment; and
 - A group of opportunities that includes cultural heritage tourism, arts and crafts production and retailing, and bushfoods retailing.
- Opportunities considered to be of medium priority include plantations/nurseries on Aboriginal owned land and a Green wood firewood industry.
- Other opportunities identified but assessed to be of low priority include large scale investment in a mill, apiary – commercial and native bee, Aboriginal studies and a site assessment consultancy.

Mineral, Construction Material and Petroleum

- Minerals exploration and production are an important economic opportunity in the Nandewar.
- The most prospective mineral resources are coal and magnesium.
- There is currently exploration in the region for petroleum (including coal seam methane), coal, gold, silver, sapphire, tin, limestone, diatomite, various base metals diamond and zeolite.

Conservation Opportunities

- In the first instance, conservation targets and objectives for the Nandewar need to be finalised and priority areas clearly defined.
- High priority conservation opportunities include:
 - Provision of education and extension material aimed at explaining the native vegetation reform process, outlining conservation objectives, and identifying available schemes and scheme champion;
 - Exploring the conservation potential of travelling stock routes as important habitat and corridors; and
 - Targeting existing timbered areas of low agricultural value.
- Of low-medium priority is the provision of funds for encouraging conservation on high opportunity cost land through development of a competitive bidding scheme.

Acronyms and abbreviations

BBSB	Brigalow Belt South Bioregion
CDEP	Commonwealth Community Development and Employment Program specifically targeting opportunities for Aboriginal community members in association with Land Councils
CMA	Catchment Management Authority
DIPNR	Department of Infrastructure, Planning and Natural Resources
DMR	NSW Department of Mineral Resources
DNRE	Victorian Department of Natural Resources and Environment
FISAP	Forest Industry Structural Adjustment Program
LALC	Local Aboriginal Land Council
LGA	Local Government Area
LPLMC	Liverpool Plains Land Management Committee
MDF	Medium Density Fibreboard
NEFA	North East Forest Alliance (interested in forest conservation)
NPWS	National Parks and Wildlife Service
OSB	Orient Strand Board
SEDA	Sustainable Energy Development Authority
RACAC	Resource and Conservation Assessment Council
RACD	Resource and Conservation Division
RFA	Regional Forest Agreement
SFNSW	State Forests New South Wales
WCA	Western Conservation Alliance (conservation interest)
WRA	Western Regional Assessments

STUDY BACKGROUND

On the back of the Regional Forest Agreements (RFA), the New South Wales Government initiated a process of regional assessments of western NSW. The Western Regional Assessment (WRA) process is designed to guide future planning and encourage partnerships to protect the environment. More specifically the WRA process is facilitating the development of options for:

- The creation of networks of formally and informally protected and managed conservation areas;
- Maintenance of viable forest based and other industries; and
- Encouraging conservation efforts on private and public land.

The Nandewar Bioregion is the second to be assessed as part of the WRA process. The Brigalow Belt South Bioregion (BBSB) was assessed in 2002.

PURPOSE OF THE STUDY

The purpose of this study was to provide an analysis of potential forest based industry development opportunities with a focus on existing and potential forested land use strategies for the Nandewar. The study also examined conservation opportunities on private and public land holdings. At the request of RACD the study was expanded to include explicit consideration of Aboriginal community development opportunities. Minerals, construction material and petroleum opportunities identified by the NSW Department of Mineral Resources (DMR) are also incorporated in this study.

METHOD

The study included a literature review, incorporation of the outputs of other WRA assessment studies, consultation, analysis of opportunities and report preparation.

The study was completed between July 2003 and May 2004.

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

Interaction within the Nandewar community to identify and assess forest development opportunities included:

- Individual interviews with agencies and industry in the bioregion, September 2003 to February 2004 (see list of persons contacted Chapter 9); this was followed by further consultation with the Forest Products Association during September 2004 (on Chapter 2 forest industry development opportunities).
- Two meetings with Aboriginal stakeholders in Gunnedah, 22 October 2003;
- A meeting with Aboriginal stakeholders in Tamworth, 4 November 2003; and
- A meeting with Aboriginal stakeholders in Tingha, 4 February 2004.

Two planned community workshops were suspended at RACD's request pending a decision on the BBSB. Given Nandewar and BBSB are intertwined formal workshops were not considered appropriate at this time.

Opportunities were developed after review of previous investigations, especially the opportunity assessment study for the BBSB, and consultation with stakeholders including members of existing forest based industries. The identified opportunities were assessed under a range of criteria including: resource availability and sustainability; availability of markets; employment created; capacity to attract investors; appropriate support infrastructure; scale of impacts created by the opportunity; skills available; community/government support; government assistance required; and capacity to create opportunities for the Aboriginal community. It had been intended to conduct a formal multi-criteria analysis ranking process at two planned community workshops, however, following the decision to suspend these workshops the assessment was based on findings from previous studies and a less formal stakeholder consultation process.

Interaction within the Nandewar community to identify and assess conservation opportunities included:

- Consultation with agencies to determine the status of conservation incentive tools in the bioregion;
- Interviews with landholders to collect their views on conservation tools;
- Three regional workshops held in Inverell, Biggara and Manilla in February 2004; and
- An internal team workshop to formulate a "way ahead".

Private and public land conservation opportunity assessment was mindful of current developments in NSW and Commonwealth natural resource policy. A review of literature and consultation with stakeholders identified five main types of incentive mechanisms. These mechanisms were assessed using the following criteria: targetability; ongoing management; cost effectiveness; transparency; monitoring and evaluation; landholder acceptability; and community/government support. Again, it was not possible to conduct a formal multi-criteria analysis with relevant stakeholders following a decision to suspend planned community workshops.

STRUCTURE OF THE REPORT

Chapter 1 provides a brief overview of economic and social conditions in the region gleaned from *NAND11 - Economic and Social Scoping and Regional Profile*. Chapter 1 also defines existing forest products and provides a review of market conditions and trends. Chapter 2 lists significant forest industry development opportunities and provides an overview of each opportunity. Chapter 3 highlights specific development opportunities related to the Nandewar Aboriginal community. Chapter 4 is dedicated to incorporation of mineral, construction material and petroleum resource opportunities.

Chapter 5 describes and evaluates private and public land conservation opportunities. The chapter includes a review of the literature and special issues relevant to conservation in the Nandewar Bioregion. Study conclusions and recommendations are provided in Chapter 6.

1 Profile of the Nandewar Bioregion

1.1 INTRODUCTION

This chapter provides a summary of economic and social conditions and an economic profile of major forest based industries. The overview of economic and social conditions is derived from work completed by Hassall & Associates as part of NAND11. The economic profile of major forest based industries includes major products, market conditions and trends.

1.2 OVERVIEW OF ECONOMIC AND SOCIAL CONDITIONS IN THE REGION

In the period since the mid 1990s the Nandewar has enjoyed employment and population growth, suggesting a level of economic and social robustness and prosperity. However, closer examination reveals that growth in the Nandewar has lagged behind performance for NSW as a whole. Also for a number of Nandewar LGAs there has been a decline in both population and persons employed. These LGAs include Barraba, Bingara, Murrurundi, Gunnedah, Quirindi and Yallaro. Strong growth in Tamworth and its peri urban/rural fringe in Parry have driven economic growth in the Nandewar. Social welfare payments exceeded taxation collected in all but Tamworth and Parry LGAs.

The region's economy is reliant on agriculture, especially broadacre grain and grazing. Agricultural production is the major employer in the smaller LGAs of Bingara, Barraba, Nundle and Manilla. Earnings from agricultural production dominate these smaller areas as well as the larger LGAs of Parry and Inverell. The services sector, including the agricultural and health services sectors, is important to Tamworth.

Key economic and social indicators include:

- The economy of the region is characterised by a high dependence on primary production, particularly broadacre agriculture.
- Health and community services are also important contributors to the bioregion's economy.
- Total employment income for the Nandewar is \$842 million or 1% of the NSW total. Approximately 54% accrues to the residents of Tamworth.
- Average household income is 82% of the state average.

- Public forests and related industries comprise <1% of the assessment region's economic activity. The industry is not a significant employer in any of the towns or LGAs in the region. Forestry production from public lands accounts for around 1% of total regional employment.
- Community sensitivity analysis reveals that the majority of LGAs in the Nandewar show a level of resilience to change and are unlikely to be affected by changes in forest use. The exception is those segments of the community reliant on Commonwealth Community Development and Employment Program (CDEP) activities. Indigenous communities who make use of public forests under CDEP initiatives are highly reliant on forest-based employment and economic opportunity.
- Indigenous community unemployment is unacceptably high. Over 50% of the Indigenous population live in rented accommodation and a large proportion of the Indigenous population are below 14 years of age.

1.3 MAJOR PRODUCTS, MARKETS AND TRENDS

A summary of major forest based products, markets and trends is provided in this section. Data was sourced from NAND11 and subsequent stakeholder consultation.

Overview statistics include:

- There are approximately 36,000 ha of State Forest and 21,500 ha of NPWS managed land in the Nandewar assessment region. It is not known what proportion of private land is forested. Total bioregion land area is 2.6 million ha.
- The native timber industry is reliant on a single species of native soft wood i.e. cypress. There is a small amount of plantation pine harvested in the Nandewar (approximately 350 m³ pa).
- The current sustainable yield of cypress is fully committed to existing customers under sales arrangements, although opportunities to enter this market do arise from time-to-time (Tom Newby, SFNSW).
- Typical annual cypress harvest is around 5,000 m³ from the Crown estate.
- Public forest yield for Nandewar, and for comparative purposes the BBSB, is shown in the table below.

TABLE 1-A***Public Forest Yield (cubic metres per annum)***

	Nandewar	BBSB
Hardwood	~500	10 000
Firewood	~500	10 000
Native Soft wood Cypress	5,000	70 000
Total	~6,000	90 000

Source: personal communication SFNSW

- In comparison to the BBSB, Nandewar is a minor timber resource. However, it does provide 40% of the cypress resource for the mill at Bingara, 20% of the resource for the mill at Gunnedah and a small amount of resource for the mill at Quirindi (5%).

Cypress Timber

Gross value and volume:

- Crown resource of 5,000 m³ harvested per annum (round log volume), a sawn recover rate of 42% (SFNSW estimate), and an average mill gate value of \$650 m³. This is equivalent to a total gross value of \$1.37 million or an economic value to the whole community of approximately \$2.65 million (based on an economic multiplier of 2.0 used to describe the flow on effects to the economy as a whole – from a report prepared by Margules Groome Poyry 1995).
- Private forestry of 880 m³ harvested per annum (round log volume), a sawn recover rate of 42%, and an average mill gate value of \$650 m³. This is equivalent to a total gross output value of \$0.24 million or an economic value to the whole community of approximately \$0.48 million. To date, private provision has been typified by opportunistic farming, neither providing high security nor high quality product. Most recently, private farming has been affected by the strengthening of regulations relating to the clearing and use of private lands (clearing of native vegetation). Figures provided by SFNSW showed that private production has fallen significantly over the last three years from 6,039 m³ in 2001, to 880 m³ in 2003, and is expected to stay at this level or decline further in the future.
- Public land based native forestry dominates cypress production in the Nandewar.
- Current industry recovery rates of around 42% green sawn product could be improved with the use of latest sawmilling technology (eg. ban saws replacing the current circular saws). Discussions with SFNSW indicated that a 10% increase in recovery efficiency (i.e. 42% to 46% recovery rate) could be achieved using the more efficient thinner saws. This, accompanied with the industries push to reposition cypress in the market to being on par with hardwood flooring prices, has the potential to result in a significant increase in returns to sawmilling companies.

Domestic Vs export markets:

- Historically sales have been Sydney (46%), country NSW (37%), Melbourne (14%), Brisbane (1%) and export (2%). Product is popular for framing and weatherboards west of the Great Dividing Range (SFNSW 1996) and flooring in Sydney and surrounds (SFNSW 2003). Recently the industry has achieved export success in Japan and the USA where the products unique termite resisting qualities and visual appearance are highly valued.

Number of operations:

- Only one cypress Sawmill is located in the Nandewar Bioregion (Bingara Cypress Pine). Some 60% of its Crown log supplies are derived from the BBSB, 40% are sourced from the Nandewar.
- The Nandewar also supplies cypress mills located in Gunnedah (20% of the Crown log supply for Gunnedah Timbers) and Quirindi (<5% of Crown log supply for R Austin).
- There are strong linkages between Nandewar operations and those in the BBSB. Businesses providing sawmilling, harvesting and haulage services operate in both areas.
- In addition to the Crown mills there are between eight and ten private property sawmills operating in the Nandewar at a small-scale level (notes provided by RACD 7 August 2003).

People employed:

- Total sector employment is estimated at 192 Full Time Equivalent jobs (FTE), 21 FTE jobs are associated with Bingara Cypress Pine and 42 FTE jobs are associated with Gunnedah Timbers (Source: BBSB GIS Toolkit).

Competition:

- Historically cypress timber harvested in the Nandewar competed against all other sources of framing and sub flooring (eg radiata pine, slash pine, steel, concrete, etc). Cypress is now recognised in the market for unique product attributes (pest resistance, durability, appearance, etc)
- The Nandewar industry works cooperatively with millers in the BBSB and other parts of NSW. A second NSW Cypress Industry Strategic Plan has recently been formulated by the industry, SFNSW, Forest Products Association of NSW and the NSW Department of State and Regional Development (SFNSW 2003).
- Crown land plantations, in comparison to their private land equivalents, currently provide more secure and better-managed product that is reflected in improved log quality. Achieving or maintaining the high quality product is a challenge for the local plantations to ensure the ability to compete.

Price and price trend:

- An upward price trend since the mid 1990's has been driven by the products shift from a commodity, competing with alternative sources of building materials on price, to a value added product with unique attributes.
- Strong recent building industry performance and the low Australian dollar has also assisted the favourable price trend. Short-term outlook may be tainted by cyclical downturn in the building industry and a rising dollar.

Distribution:

- All Cypress sawlog from State forests and Crown Timber land in the Nandewar Bioregion is sold on a delivered sale basis whereby SF harvests and delivers the logs to the mill. Mills supply local markets direct. The supply chain involves SFNSW selling to sawmills; sawmills sell milled products to agents, merchants or builders. Agents and wholesalers are a critical part of the supply chain for metropolitan and export markets.

Key points and summary:

- The cypress industry is contiguous between the BBSB and Nandewar. Cypress mills in Nandewar are linked to both bioregions.
- Industry has shifted market position from a low cost supplier of poor quality product to higher unit priced and quality assured product that includes significant export sales.
- Since mid 1990's mills have invested in value adding including kiln drying and the development of higher value products such as flooring, weatherboard and panelling
- A quality assurance program has been implemented with independent auditors that assure a high (minimum) standard is achieved.
- Significant further exporting opportunities exist.
- Future industry development includes value adding opportunities such as lamination, large sectional area beams, finger jointing and growing of termite resistant wood.
- Wood supply certainty and quality currently limit industry growth.
- Crown land plantations, in comparison to their private land equivalents, currently provide more secure and better-managed product that is reflected in improved log quality.
- By product opportunities include firewood briquettes and oil distillation -linked to BBSB to ensure sufficient resource volume.

Hardwood

- Historically, Crown sales of hardwood in the Nandewar have been limited to small volume sales (between 500 m³ to 1,000 m³ per annum) of New England stringy bark.
- These sales have been discontinued. The resource has diminished and two forests in the Inverell Management Area (part contained in the Nandewar) were converted to national park to the coastal RFA process.
- Unlike the Pilliga in the BBSB there is no maturing narrow or broad-leaved ironbark resource in the Nandewar (Ross Irvine, SFNSW).
- Ironbark resource is confined to a small volume of silver leafed ironbark. However, Silver leafed ironbark is not generally regarded as a commercial species. Silver leafed ironbark tends to produce hollow logs and “onion ring” when sawn.
- Because of limited commercial ironbark supply, the forests of the Nandewar were never extensively cut for sleepers or fence posts. Furthermore, there is no active management of eucalypt forests i.e. thinning in the Nandewar. Consequently, there is minimal residual available for firewood cutting.
- Moree based Aboriginal groups working through CDEP initiatives cut some hardwood for firewood but this mainly takes place in the BBSB.
- Key point: the Nandewar has only a minor hardwood resource with limited opportunities for additional harvest.

Plantations

- There are some 13,000 ha of plantation in the New England region, some of which occurs in the eastern fringe of the Nandewar. Plantations are dominated by *Pinus radiata*. *Pinus radiata* plantations in the Nandewar have been adversely effected by bushfire and drought.
- A new sawmill is being established in Quirindi and *Pinus radiata* plantations to the east of the Nandewar (Walcha) will serve this mill.
- *Pinus radiata* is marginal in the Nandewar; profitability would be dependent on the development of salinity credits. Viable areas for salinity credits were identified as being further east than the Nandewar (i.e. higher rainfall, better soil and closer to markets).
- SFNSW have established plantation trials to the west (Warialda) and south (Liverpool Plains) of the Nandewar that could have long-term implications for the viability of plantations in this region.
- Production of timber to service firewood markets was identified as the main commercial use of plantation grown timber when SFNSW trials were established in the mid 1990s.
- Trial species included black wattle, red gum, ironbark, sugar gum, spotted gum and various hybrids. Seed from different provinces has been used in the trials.
- Key point: the eastern fringe of the Nandewar is acceptable for *Pinus radiata* plantations; trials of native species have implications for future plantation production in the bioregion.

Apiary

- Nandewar Bioregion is important to honey production in NSW. However, it is less critical to the viability of the industry than the BBSB.
- There are 93 apiary sites on public land in the bioregion; 83 are located in State Forests, two on Crown land and eight in Kwiambule National Park.
- A similar number of sites are thought to exist on private property.
- The total value of apiary products – honey, wax, queen/package bees and pollination was estimated at approximately \$1million in 2001 (see NAND11).
- There is a shortage of honey in Australia at the current time. Exports have been curtailed by the 2003 drought and imports have been sourced from Argentina to meet domestic demand. Varietal honey is increasing in popularity (Sydney Morning Herald Good Food Guide) and there may be some scope for regional branding of product harvested in the Nandewar. The study has been asked to consider the potential of native bees.
- Key point: native forests in the Nandewar are an important floral resource for apiarists.

Grazing

- Very few of the Nandewar forests have grazing rights issued. The grazing offered by Nandewar State Forests is of low quality (Tom Newby, SFNSW).
- No grazing permits are issued for the 35,719 ha of State Forests in the Nandewar and only 16 Occupational Permits are granted. Occupational Permits total 12,208 ha. Grazing using an Occupational Permit is limited to periods of acceptable climatic conditions i.e. grazing is not permitted during drought.
- Key point: given the low quality of grazing in the forests of the Nandewar no further consideration is given to grazing as a forest based development opportunity.

Tourism and Recreation

Gross value and volume:

- Tourism New South Wales estimates that approximately 0.7 million visitors spent 2.1 million visitor nights and incurred costs of \$148 million in the LGAs wholly contained within the Nandewar Bioregion in 1996/97 (Tourism NSW, 1998)¹. If tourism in the Nandewar has grown at the same rate as tourism in the whole of NSW, then Nandewar tourism would now be valued at approximately \$183 million (Hassall estimate²).
- A small percentage of this visitation would be in forested areas. In 2002/03 there were approximately 28,000 visits to national parks in the Nandewar (NPWS pers. comm).

¹ 1996/97 data is the most recent data available for the Nandewar bioregion. Tourism NSW does however, provide up-to-date tourism trends for NSW in aggregate.

² Hassall have extrapolated the most recent tourism figures available for the Nandewar bioregion in line with current data for NSW to estimate this figure. It is therefore assumed that tourism in the Nandewar Bioregion has grown at the same rate as the rest of NSW – Hassall has no further evidence to suggest that this may or may not be the case.

October 2003). SFNSW do not record visitation to forests within the Nandewar Bioregion (SFNSW, written communication, 11 November 2003).

- It is understood that there is little tourism and recreation in Nandewar State Forests (see NAND11). Tourism and recreation is confined to the issue of a small number of fossicking permits. This is because Nandewar State Forests are surrounded by private property and are difficult to access (Tom Newby, SFNSW).

Domestic Vs export markets:

- Few international tourists visit the Nandewar. Local families and retirees travelling independently dominate visitation.

Number and type of operations:

- Tourism New South Wales identifies 148 natural, historical and commercial attractions in the bioregion while the National Roads and Motorists Association (NRMA) identifies 41 natural, commercial and sight seeing opportunities. Most operations are small scale in nature. The region's major tourism events are the Tamworth Country Music festival in January (500,000 visitors) and AgQuip Gunnedah in August (100,000 visitors).
- The region has a natural comparative advantage in fossicking and bird watching based activities. Horse riding and mushroom picking are also practiced in some forested areas.
- Backpackers are an important source of visitors to Inverell and Bingara (Tom Newby). Backpacker busses spent multiple nights in the region and up to three busses per week make use of attractions in the Nandewar Bioregion.
- The Fossickers Way is a major regional attraction (Roger McEvilly, DMR).
- Bird watching, including bird watching trails and maps are important (Russ Watts and Cecil Vander, National Parks Association).
- Accommodation ranges from four-star hotels in Tamworth to camping and caravanning throughout the bioregion.

People employed:

- Tourism and recreation are not recorded separately in ABS statistics. However, it is worth noting that total "accommodation, café, restaurant, cultural and recreational services" sector employment in 2001 was almost 1,800 people.

Price and price trend:

- Pricing and advertising arrangements to attractions varies considerably. In other studies (e.g. RACAC, CARE, EBC 2000) it has been estimated that one third of rural attractions attract no admission fee.

Distribution and promotion:

- Tamworth has the largest visitation, but relative to total economic activity, it is the smaller shires that are most heavily dependent on visitors.
- Forest based tourism operators generally rely on word of mouth.

Key points and summary:

- Visitors make a significant contribution to the Nandewar economy with 0.7 million visits valued at \$148 million in 1996/97 (Tourism NSW 1998) and an estimated \$183 million in 2002/03 (Hassall estimate).
- The portion of this value captured by forested areas is small being as little as 1.5% of total visitation to the region.
- The bioregions comparative advantage is in fossicking, bird watching and possibly mushrooming and horse riding.

Minerals, Construction Material and Petroleum

Gross value and volume:

- Recent annual production \$16 million, royalties of \$0.6 million (Roger McEvilly, DMR).
- Most important commodities currently mined are limestone, sapphire, diatomite, zeolite and various construction materials. Coal has probably the most significant development potential.
- On a state scale, the region is not a major mineral producer but provides a wide variety of minerals and construction materials. It is an important supplier to local markets (Roger McEvilly, DMR).

Domestic Vs export markets:

- Most products are utilised in domestic applications.

Number and type of operations:

- Thirty-seven exploration licences – diamonds, gold, base metals, limestone, diatomite, serpentine, magnesium, sapphire, corundum, zircon, zeolite, coal and petroleum;
- Thirty-four mining leases – diatomite, clay/shale, limestone, sapphire/zircon, rhodonite, serpentinite, diamonds, gold, kaolin, garnet, ilmenite, kaolin, copper, lead, jade, rhodonite, nephrite, zeolite;
- Four private land leases – brick clay, fire clay, kaolin, structural clay, sapphire, arsenic, barite, copper, diamond, gold, lead, mercury, molybdenite, scheelite, silver, topaz, tungsten and zinc;
- One coal authorisation;
- One gold lease;

- Fourteen mineral claims-diatomite, diamond, gold, sapphire, corundum, zircon, serpentine;
- Three mineral assessment leases – sapphire, corundum, zircon and zeolite;
- Eight operating/ intermittently operating quarries for coarse aggregate and construction materials and thirty-two for unprocessed construction materials;
- One mining lease application;
- Three assessment lease applications; and
- Ten exploration licence applications.

People employed:

- In 2001, a total of 90 people were employed by the mining industry. This total is down from a recent peak of 141 in 1996 with significant declines having occurred in the Barraba and Inverell LGAs (ABS Census data 2001).

Price and price trend:

- Determined by health of the building industry, competitive sources of supply in other regions, advances in geological science and mining and quarrying technology and, for internationally traded commodities, international commodity price cycles. The minerals sector is currently experiencing an upward price cycle.

Key points and summary:

- Diverse mineral resource generating \$16 million in production values (Roger McEvilly, DMR). Production values may vary significantly from year to year.

2

Description and Evaluation of Forest Development Opportunities

2.1 INTRODUCTION

Opportunities for expansion of significant existing or new forest industries have been identified and reviewed in this chapter. Consideration has also been given to opportunities that may add critical mass to BBSB high priority opportunities. Opportunities have been assessed on a sector basis consistent with the review of products, markets and trends completed in Chapter 1. Development opportunities assessed in this chapter include:

- Cypress timber industry:
 - Further processing;
 - Export opportunities;
 - Co-product utilisation;
 - Silviculture; and
 - Investment in education and training.
- Hardwood and other native timber products;
- Plantations, woodlots and agroforestry, including effluent irrigated woodlots;
- Renewable energy industries – wind farms;
- Apiary products, including native bees;
- Wild harvest – oils, seeds, foliage etc;
- Short rotation crops of native species;
- Harvesting of native meats;
- Grazing;
- Integrated natural resource management; and

- Tourism and recreation – forest based:
 - New camping grounds in State Forests;
 - Tourism and recreation infrastructure – walking trails, road signs and roads;
 - Maps and guides;
 - Collaborative tours; and
 - Development of a Regional Tourism Strategy.

The review was mindful of existing regional strategies including those prepared by local interest groups and the three tiers of government.

2.2 CYPRESS TIMBER INDUSTRY

White cypress pine is a honey coloured aromatic Australian native timber. It has high durability and the environmentally desirable property of being naturally termite resistant. The product mix for Australian cypress varies across mills depending on log quality, location and market focus, and includes (SFNSW 2003):

- Structural timbers;
- Flooring – air dried and kiln dried;
- Weather boards;
- Decking;
- Pickets; and
- Other dressed products.

White cypress pine timber product opportunities identified in the BBSB are relevant to Nandewar as the cypress industry is contiguous between the two regions. Opportunities include further processing, export market development, utilisation of by-products and silviculture. Essential to the growth of the industry and the development opportunities identified is the need for investment in research and development, education and training, and continued secure access and supply of the timber resource.

Cypress timber product opportunities identified in the BBSB and considered relevant to Nandewar are discussed in the section below and conclusions made on their viability. Where relevant the conclusion has been updated on the basis of more recent or additional information including data and strategies from the second NSW Cypress Industry Strategic Plan 2004-2010 (SFNSW 2003) (hereafter referred to as “the CISP”) and the Strategic Business Plan for the Pilliga-Goonoo Regional Development Forum (Robin Owen & Associates 2002).

Further Processing

Opportunities to further process cypress timber is consistent with the industry's second strategic plan. The main opportunities are:

- Production of higher quality boards including flooring and joinery for domestic and American markets;
- Increasing the percentage of product that is dried and dressed;
- Introducing finger joints and laminating capacity;
- Incorporating ironbark in laminates to increase the strength of structural timber;
- Pre-finishing and polishing; and
- Timber drying through microwave technology.

The CISP has identified flooring applications as holding considerable opportunities, primarily in the domestic market. The natural termite resistance, durability and distinctive appearance of Cypress make it suitable for wood flooring. Cypress flooring is also price competitive compared with hardwoods. Cypress is currently stocked by resellers and specialist flooring companies in Australia, and small volumes are exported to the US and Japanese markets. With the rise in fashion for home renovation it is seen as an area of considerable potential for domestic growth. Pre-finished flooring is identified as the next stage in product and market development.

Increasing the capacity for production of laminated products is another key identified area of opportunity. Laminated products achieve a uniform quality and allow for utilisation of lower grade sawn timber, which together allows for maximisation of the whole of log return. High valued engineered beams can be manufactured for use in applications where structural requirements are specified.

An assessment of further processing opportunities for cypress timber is presented in Table 2-A.

TABLE 2-A
***Assessment of Opportunities for Further
Processing of Cypress Timber***

Resource availability	<ul style="list-style-type: none">• The opportunity is substantially reliant on further processing of existing resource rather than harvesting additional cypress.• Current industry investment has been on hold until resource security assured and WRA process complete.
Markets	<ul style="list-style-type: none">• Stable domestic base and growing export markets.• Trends in the home renovations sector indicate considerable growth potential.• Top line products sell themselves. Finger joints and laminates are an obvious way to increase the value of second grade material.
Employment created	<ul style="list-style-type: none">• Incremental direct employment.

Capacity to attract investors	<ul style="list-style-type: none"> Commercial opportunity with resolution of current uncertainty regarding resource security. Small scale laminating plant costs require investment in the order of \$0.5 million.
Scale of impact	<ul style="list-style-type: none"> A single laminating plant is thought to be viable. Laminating and finger joint investment could be viable for a single plant in the region or on a cooperative basis. 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	<ul style="list-style-type: none"> Yes, overseas study tours undertaken by CISP members, partnering with New Zealand laminating/gluing specialists plus an active research and development program supporting this area. Major improvement in gluing technology in the last few years.
Appropriate support infrastructure	<ul style="list-style-type: none"> Supply (SFNSW plus private resource cypress) and distribution (transport, agents, merchants, export links) already established.
Capacity to create opportunity for the Aboriginal Community	<ul style="list-style-type: none"> Existing Aboriginal employment in mills. Opportunity for Aboriginal ownership of mills is explored separately in Chapter 3.
Community/Government support	<ul style="list-style-type: none"> Consistent with NSW government policy to add value to natural resource harvest.
Government assistance required	<ul style="list-style-type: none"> 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. Business plans have been formulated to realise this opportunity and investment is awaiting the outcome of the BBSB and Nandewar assessments. Timber drying through microwaving is not considered a commercial proposition at this stage.

Export Opportunities

Currently approximately 11% of NSW Cypress production is exported³. The key export market for NSW is Japan, and its secondary market is the U.S. In contrast, the Queensland Cypress industry mainly exports to the US market.

³ NSW Cypress Industry Strategic Plan 2004-10 (2003), p. 58.

American Market

Opportunities have been identified for the NSW Cypress Industry to follow Queensland into the US market. Viable opportunities for Australia in the US market lie in developing products that target higher value niches, as price relativities, exchange rates and competition preclude entry to markets for lower value Cypress.

This opportunity however, holds the risk of increasing competition between the NSW and QLD industries, and increasing price competition in Cypress products to the US. Cooperation with the Queensland industry to achieve a national marketing strategy for Australian Cypress is part of the second industry strategic plan.

The opportunity also holds risks for NSW in its possibility of diverting attention away from maximising opportunities in other markets, particularly the Japanese export market.

Japanese Market

Cypress is now an accredited product under the Japanese building regulations thus providing access to the Japanese housing market. Currently a major market for cypress in Japan is in exporting dodai products. Dodai is a structural timber used in traditional Japanese house construction. The dodai market demands a high quality product, which is earthquake and pest-resistant, and currently dodai production uses only higher-grade logs and has a relatively low recovery rate.

Opportunities have been identified for laminated dodai production. The uniform quality of laminated products and their use of lower grade timber, mean that laminated dodai has an advantage over the current dodai product with its high wastage. A move towards exporting laminated products to Japan holds considerable opportunity for market development and for better utilisation of the whole of the product. The opportunity is complementary to the further processing opportunities outlined above.

TABLE 2-B

Assessment of Opportunities for Export Markets

Resource availability	<ul style="list-style-type: none">• Reliant on further processing and redirecting of existing resource, may need to draw product from the domestic market.• 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	<ul style="list-style-type: none">• Large US market and limited supply from Queensland.• US product requirements is floorboards and cladding, which may complement Japanese requirements for structural timbers.• Risk lies in size of US market – Weyerhaeuser minimum order is 20 container loads. Could be a distraction from domestic opportunities.• Japanese market still has plenty of growth.• Japanese market requires earthquake and pest resistant timber, especially 5-inch square “dodai” that is difficult to supply without laminating and finger joints. Product also used in ornamental bridges.

Employment created	<ul style="list-style-type: none"> Incremental direct employment to the extent that additional dressing is required.
Capacity to attract investors	<ul style="list-style-type: none"> Commercial opportunity with resolution of current uncertainty regarding resource security.
Scale of impact	<ul style="list-style-type: none"> Capacity to add to drying and dressing, laminating and finger joint investment outlined above.
Skills available	<ul style="list-style-type: none"> Yes.
Appropriate support infrastructure	<ul style="list-style-type: none"> Yes. Cooperative arrangements with the Queensland industry would be advantageous.
Capacity to create opportunity for the Aboriginal Community	<ul style="list-style-type: none"> As per further processing above.
Community/Government support	<ul style="list-style-type: none"> As above.
Government assistance required	<ul style="list-style-type: none"> 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 US market for Australian Cypress is part of the 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 if improperly managed it may also create price competition with Queensland. The opportunity should therefore be pursued with caution.

Increasing focus on the US export market may also divert resource and attention from maximising opportunities in the established and growing Japanese market. A move towards exporting laminated products to Japan is considered a high priority opportunity.

Co-product Utilisation

The Cypress industry recognises the need to improve the value of lower-grade sawn products and sawmill waste. Several areas are identified as providing opportunities for co-product utilisation, as follows:

- Cypress oil for improved pest resistance and strength in other structural timber;
- Firewood briquette manufacturing from mill waste after oil is extracted;
- Cogeneration of electricity from mill by-products; and
- Utilise waste to part fuel an ethanol distillation plant.

These opportunities are discussed in further detail below. An overall assessment of opportunities is provided at the end of this section.

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. Cypress oil is extracted from sawdust and mill waste using steam distillation. The oil is applied to timber (eg radiata pine or the sap wood of cypress which is not termite resistant) to add pest resistance and strength. 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 US. The industry has funded research and development to further the products development. The opportunity identified in the BBSB and carried over to Nandewar would be to utilise research and development findings to increase production to a commercial scale.

Cypress oil production would therefore seem to hold considerable potential for utilisation of what is currently a waste or low value by-product.

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.

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. The plant is more viable in the BBSB than the Nandewar, however, as a variety of hardwoods is available.

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.

The opportunity however, is considered marginal on a number of fronts. The most significant being: the availability of resource to power the plant; and the possibility of community resistance to the proposal.

Of greater potential is “gasifier” technology. This process adds value to low value by-product by converting it to marketable fuel. The high efficiency gas turbines used in the process produce electricity and exhaust heat from the gas turbine, which is transferred for use in kiln drying. This process is currently being pursued by some millers in NSW (SFNSW 2003) and its use in some of the larger mills in the region may be possible.

Utilise Waste to Part Fuel an Ethanol Production Plant

An ethanol production plant is being considered for sites in the BBSB.

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 indicated in the BBSB assessment 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.

Mill waste from Bingara is currently trucked 500 km to Liddel Power Station in the Hunter Valley. This is a minor potential opportunity if a plant is established within an economic radius of timber mills.

TABLE 2-C

Assessment of Opportunities for Co-product Utilisation

Resource availability	<ul style="list-style-type: none">• Makes use of current industry waste.• However, doubtful that there are sufficient volumes to support stand-alone industries in the Nandewar. A consolidated approach with the BBSB is a more favourable option.
Markets	<ul style="list-style-type: none">• Markets may exist however are largely unproven.
Employment created	<ul style="list-style-type: none">• Incremental, if plants are added on to existing mills in Nandewar or BBSB.
Capacity to attract investors	<ul style="list-style-type: none">• Commercial opportunity to add new income stream to existing regional mill businesses.• Co-generation may have appeal to SEDA or an existing power generator.
Scale of impact	<ul style="list-style-type: none">• Small to medium scale impacts on employment
Skills available	<ul style="list-style-type: none">• Additional training would be required to build capacity of local employees with available research and development outputs.
Appropriate support infrastructure	<ul style="list-style-type: none">• Supply of materials from mills and SFNSW.• Some infrastructure required.• Technical support could be brought to the bioregion.
Capacity to create opportunity for the Aboriginal Community	<ul style="list-style-type: none">• Co-product opportunities might utilise CDEP labour, however, opportunities likely to have more significant impacts on aboriginal employment are identified in Chapter 3.

Community/Government support	<ul style="list-style-type: none"> • Consistent with NSW government policy to add value to natural resource harvest. • Production of greenhouse friendly fuel likely to gain community support.
Government assistance required	<ul style="list-style-type: none"> • Most important thing is resource security assurance. • Might be some assistance available through government grants and funding.

In summary, there is some opportunity for utilisation of by-products of cypress in Nandewar. However, a consolidated approach with the BBSB is likely to be a more viable opportunity. Cypress oil appears to have the greatest potential.

Silviculture

Silviculture is defined as the deliberate management of a forest to achieve a specific range of objectives (SFNSW 2003). Silviculture practices aim to improve the productivity of forests while maintaining functional ecosystems. Research at the Western Plains Zoo, by SFNSW and DIPNR is understood to support claims that thinning would reduce soil erosion and increase the diversity of plants and animals in cypress forests.

Silviculture practices identified as potential development opportunities in the Nandewar include cypress poles for organic wine industry trellising and supplementary cypress thinning.

Supplementary cypress thinning

As was the case in the BBSB assessment, this opportunity relates to public funds being 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.

In addition to future sawlog supplies and nature diversity benefits, there is the potential to generate significant employment opportunities for local unskilled labour. It would also improve the grazing potential of cypress forests.

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.

An assessment of silviculture opportunities in the Nandewar is summarised in the table below.

TABLE 2-D

Assessment of Opportunities for Silviculture Practices

Resource availability	<ul style="list-style-type: none"> Public land is presently available - linked to an expanded thinning program in State Forests within the bioregion. Nature of agreements with landholders would determine the supply of private land for thinning. Capital funding from Government is the major hurdle.
Markets	<ul style="list-style-type: none"> Supplementary thinning for sawlogs would add to the current supply of NSW cypress. Cypress poles however, would find it very difficult to compete on price with treated pine grown on plantations i.e. "koppers logs". Further, a niche player already exists in the trellising sector; additional supply may destroy a small market.
Employment created	<ul style="list-style-type: none"> Thinning is likely to generate employment. Minor additional employment from pole processing. More significant employment from thinning for sawlogs. Employment created for local indigenous, long time unemployed and youth.
Capacity to attract investors	<ul style="list-style-type: none"> Supply of sawlogs from thinning will rely largely on public sector investors (eg NSW Government or CDEP). Small opportunity for trellising. Since BBSB assessment, UK wine buyers requesting future supply of "untreated" trellis has provided some boost to demand.
Scale of impact	<ul style="list-style-type: none"> Medium to large for sawlogs – it is proposed that 1,000 ha pa would be thinned on private lands and 2,000 ha pa on public lands. Minor for trellising.
Skills available	<ul style="list-style-type: none"> Skills available in the region. Possibly some training required.
Appropriate support infrastructure	<ul style="list-style-type: none"> Supply of inputs available from proposed thinning program. Potential for support from State Forests, FPA and CDEP.
Capacity to create opportunity for the Aboriginal Community	<ul style="list-style-type: none"> Employment possibilities in a thinning program, both in terms of directed employment and strengthening links to Nandewar forests.
Community/Government support	<ul style="list-style-type: none"> 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. Support from FPA millers and local conservation interests.
Government assistance required	<ul style="list-style-type: none"> Funding of \$750,000 pa required for design of a cypress thinning program, management and operating costs.

Silviculture 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. Particular care needs to be taken not to flood the market of any existing players, particularly in the trellising sector.

The opportunity has been advanced by the Red Chief Local Aboriginal Land Council since the BBSB assessment and now requires a comprehensive feasibility study with a strong emphasis on market research.

Investment in Research and Development, Education and Training

Key to progressing the development of the cypress industry in the Nandewar Bioregion is investment in, and adoption of the latest research and development outputs through industry education and training. The second strategic plan (SF NSW 2003) has outlined the industry's commitment to:

- Enhancing market intelligence;
- Improving business management through benchmarking and training;
- Capitalising on gains from the Quality Assurance program; and
- Focusing on people to provide a safe and productive career environment.

Discussion with Doug Werrin, TEMS⁴, indicated that training programs offered to mill and processing employees, and harvesters have been well received in the Nandewar Bioregion. Training has included both technical and core competencies, such as numeracy and communications. In many cases, government assistance has been received through the National Traineeship Program and forestry re-structuring funds.

It is believed that there is further opportunity and scope to improve current training in relation to improved processing efficiencies and reduction in resource wastage. A number of other specific training needs have been identified in consideration of the development opportunities outlined above.

Some industry representatives have identified the need for an education and training facility for timber and related industries to be established in Nandewar or the broader region. This could include research and development facilities for the timber industry to build capacity in research into value-adding timber products. If provided an education and training facility would provide training to operators on the production of flooring and other processed cypress products, therefore increasing the number of skilled operators in the region. However, the feasibility of establishing such a facility would have to be considered against the option of using existing registered training providers to include these elements in current programs.

⁴ TEMS are registered trainers for the forestry industry.

Summary

The following opportunities are relevant for Nandewar. Relevance and ranking was confirmed with Peter Turnbull (Bingara Cypress Pine) and Patrick Paul (Gunnedah Timbers) and has been reviewed by the FPA (October 2004).

- Further processing of cypress timber through additional drying and dressing, finger jointing, lamination and pre-finishing. Opportunity to be explored in tandem with the BBSB. Opportunity was regarded by the industry as being of higher priority than Forest Industry Structural Adjustment Program (FISAP) assistance (high).
- Further processing to better service the growing Japanese market (high).
- Silviculture to utilise thinnings – supplementary cypress thinnings. Part of the Red Chief business case (medium - high).
- Follow the Queensland cypress industry into the US market. Opportunity described in second NSW Cypress Industry Strategic Plan (medium).
- Cypress co-product utilisation, cypress oil for improved pest resistance and strength in structural timber. Part of the Red Chief business case (medium).
- Cypress co-product utilisation, firewood briquette manufacturing from mill wastes after oil is extracted. Part of the Red Chief business case (medium).
- Cogeneration of electricity from mill by-products – subject to confirmation of the commercial feasibility of “gasifier” technology and requiring “commercial underwriting” of technical merit (medium).
- Co-product utilisation, utilise waste to part fuel an ethanol production plant, viability of this option will be determined by other factors (medium).
- Co-product utilisation, use of by-products in MDF or OSB production (low).

High priority opportunities in relation to cypress are linked to further value adding of the existing harvest and supplementary cypress thinning. Further value adding of existing harvest is now part of the NSW cypress industry’s culture and will be assisted by resource security following conclusion of the BBSB and Nandewar Assessment processes.

Underlying the development of the cypress industry in the Nandewar Bioregion is investment in, and adoption of the latest research and development outputs through industry education and training.

2.3 HARDWOOD AND OTHER NATIVE TIMBER PRODUCTS

Unlike the BBSB, where there is an emerging commercial hardwood resource suitable for milling, no equivalent resource exists in the Nandewar.

2.4 PLANTATIONS, WOODLOTS AND AGRO-FORESTRY

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

- Meet demand for timber products (eg firewood and cabinet timbers);
- Establish new farm enterprises (eg seed orchards, bushfoods, medicinal/cosmetic plants, eucalyptus oil, cut flowers/foilage);
- Meet land management and reclamation goals (eg salinity and greenhouse credits);
- Improve farm productivity (eg windbreaks, stock fodder, drought proofing with edible species, soil improvement, manage salinity recharge); and
- Manage regrowth for private native forestry.

These opportunities were reviewed in the BBSB, however, higher rainfall in Nandewar and an existing plantation industry means that an explicit examination is also relevant here.

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

Plantations were deemed to be non-commercial in the BBSB. Key factors determining the viability of plantation production are (New England North West Regional Development Board 2002):

- Establishment costs;
- Tree survival rates;
- Length of rotation;
- Market access;
- Cost of silviculture and on going management;
- Timber growth rates, product yields and quality;
- Stumpage prices; and
- Distance to sawmills.

Put simply, rainfall was too low and distance from markets too great in the BBSB (RACAC 2002).

The Nandewar Bioregion overlies the western part of the NSW Northern Tablelands see Figure 1 below. The Northern Tablelands is a viable plantation production area.

FIGURE 2-1 MAP OF THE NORTHERN TABLELANDS



Source: ABARE 1999

Key: Shaded area indicates areas suitable for Pinus radiata plantation including “high”, “medium” and “low” suitability.

In its 1999 examination of forest plantations on cleared agricultural land, ABARE, found that in the Northern Tablelands:

- There are 13,000 ha of established plantation;
- Some 93% of the plantation area was Pinus radiata, a widely used construction softwood; and
- There was 2.8 million ha of cleared land suitable for plantation production (see Figure 1), however 90% of this land was considered to have low plantation productivity, 9% was considered to have medium productivity and only 1% was considered to have high plantation productivity.

The one percent of high plantation productivity land was located in the eastern fringe of the Northern Tablelands and outside the Nandewar Bioregion. ABARE also concluded that medium productivity land would have difficulty competing with traditional agricultural enterprises for commercial returns.

ABARE's conclusion was reviewed with SFNSW who confirmed that growth rates in the Nandewar Bioregion are not as high as those in higher rainfall areas to the east. Consequently superior rainfall and fertile soils will attract commercial investment in plantations in the foreseeable future.

Woodlots and agro-forestry to improve farm performance

In addition to large-scale plantations, agro-forestry and woodlots are being championed as a means of improving farm performance (see for instance New England North West Regional Development Board 2002). Plantations in the New England northwest are expected to reduce groundwater recharge, improve river water quality and provide an alternative source of farm income (New England North West Regional Development Board 2002). Other potential benefits include:

- Shelter for adjoining crops and pastures;
- Thinnings suitable for firewood and fencing;
- Honey and bees wax production potential;
- Seed collection;
- Medicinal and perfume resources,
- Habitat for animals and birds that control pests;
- Aesthetic benefits; and
- Improved recreation experiences.

Economic performance of woodlots will depend on the interplay of farm benefits and income received from thinnings and final harvest. A number of economic analyses have indicated that woodlots require financial benefits to be derived from other means such as environmental, carbon and salinity credits to make them competitive with conventional agricultural enterprises (New England North West Regional Development Board, 2002). Key determinants of farm profitability from woodlots are as per plantations, i.e.:

- 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 the profitability of *Pinus radiata* woodlots in the Nandewar Bioregion, the dominant plantation species with readily assessable markets, is presented in Table 2-E. On-farm production benefits were set at zero for the initial analysis.

TABLE 2-E**Woodlots, Agro-forestry – Assumptions and Breakeven Analysis**

Assumption	High	Medium	Low	Breakeven values for medium scenario
Pine Tree Rotation	30 years	30 years	30 years	30 years
Establishment cost (\$/Ha)	2,500	2,500	2,500	1,771
Growth rates	24 m ³ /year [MAI]	14 m ³ /year [MAI]	7 m ³ /year [MAI]	20 m ³ /year [MAI]
Stumpage price (\$/m ³)	30	30	30	42
Net Present Value \$/ha	\$536	-\$729	-\$1,614	\$0
Equivalent Annual Value \$/ha	\$43	-\$59	-\$130	\$0
On farm productivity benefits	N/a	N/a	N/a	~\$59/Ha/yr

Source: Hassall & Associates analysis using RIRDC's Carbon Farmer Model with carbon related costs and benefits set at zero so that only the timber activity is considered. There is no current market for the carbon benefits created.

Table 2-E summarises the assumptions, results and breakeven analysis of a *Pinus radiata* woodlot. A real discount rate of 7% was applied. For the woodlot to be profitable the growth rate, stumpage price and establishment costs would need to change. None of the breakeven results are likely in the Nandewar. The implication of this analysis is that the on-farm productivity benefits would need to be in the order of \$59/ha/yr for the 30-year period, before woodlots would breakeven in the Nandewar Bioregion⁵. Off-farm benefits (e.g. watertable control in other locations) could directly substitute for the on-farm productivity benefits, but there is no current mechanism for these to be paid.

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, competition from other agricultural enterprises and low to medium rainfall areas such as the Nandewar 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, seed orchards can be established anywhere. High value low volume seed will stand long distance transport costs. Seed orchards need to be managed as a crop and farmers need to be aware of agronomy and weeds. There is a small

⁵ It is worth noting that economic performance in the Nandewar is superior to that achieved in the BBSB (deficit of \$130/ha/yr) and this may have policy implications if cross-bioregion programs are being considered, i.e. other things being equal it would be better to invest in the Nandewar.

seed orchard operating near Wee Waa in the state's northwest. 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 Nandewar Bioregion. 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 Nandewar Bioregion is a more active management of on-farm regrowth for timber production. Large areas of cypress regrowth exist on private lands in the bioregion and much of this resource is not managed for forestry returns.

Simple silviculture practices such as thinning would result in improved growth rates and final 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 1997* need to be complied with before thinning activities can be contemplated.

Advice from the forestry sector is that slow regrowth rates can limit the economic viability of regrowth management. Harvest time is simply too far into the future to recoup investment cost outlays (thinning costs).

Opportunity Assessment

An opportunity assessment of plantations, woodlots and agro-forestry is presented in Table 2-F.

TABLE 2-F
***Assessment of Opportunities for Plantations,
Woodlots and Agro-Forestry***

Resource availability	<ul style="list-style-type: none"> Land is available to establish tree-based enterprises but rainfall and soils are sub-optimal. Potential for increased private production has been moderated by strengthened regulation (with regards to native vegetation). Potential for forest based economic growth is limited by the small area covered by State Forests in the Nandewar region.
Markets	<ul style="list-style-type: none"> Markets for firewood and commercial timber species are available. Distance to markets (a cost) is an issue but is more manageable than, say, the BBSB.
Employment created	<ul style="list-style-type: none"> Minor.
Capacity to attract investors	<ul style="list-style-type: none"> Most likely as an on-farm diversification opportunity. Rainfall and soil suitability may limit investor interest.
Scale of impact	<ul style="list-style-type: none"> Small to medium.
Skills available	<ul style="list-style-type: none"> 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 (eg New England – North West Forestry

	Investment Group).
Appropriate support infrastructure	<ul style="list-style-type: none"> • Yes, especially for conventional products such as firewood and mill timber.
Capacity to create opportunity for the Aboriginal Community	<ul style="list-style-type: none"> • Employment in a thinning program.
Community/Government support	<ul style="list-style-type: none"> • Community is likely to be supportive.
Government assistance required	<ul style="list-style-type: none"> • Idea has been raised for an active thinning program on public lands to promote timber and biodiversity but hard to justify in private areas. Private area investment would need to be bolstered with government assistance and/or the development of markets for unpriced benefits (eg salinity or carbon credits).

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

2.5 PLANTATIONS IRRIGATED WITH EFFLUENT

An alternative to plantations, woodlots and agro-forestry that addresses rainfall and soil quality constraints in the Nandewar is the irrigation of plantations using treated sewerage effluent. Treated sewerage effluent has the potential to provide both water and nutrients to trees in a plantation. The North East Forest Alliance and Western Conservation Alliance (NEFA/WCA) suggested this opportunity for consideration. Specifically, treated sewerage effluent from sewerage treatment plants in local towns would be harnessed to produce fast-growing firewood plantations.

To assess this opportunity a long list of towns in the Nandewar was prepared (sourced from NAND11) and consultation completed with local government to determine their status in regard to effluent treatment and reuse. Results are summarised in Table 2-G.

TABLE 2-F

***Irrigated Plantation Potential – Effluent
Generation in the Nandewar***

Town	Population (~EP)#	Effluent reuse status/Comment
Tamworth	40 000	Major reuse scheme proposed. Scheme based on pasture for dairy production.
Inverell	15 000	Effluent is treated and released into river/creek. No re-use scheme operating however there has been one expression of interest from a nearby cattle property.
Bingara	3 000	Treated and released into the river. They are looking at re-use possibilities at the nearby racetrack.
Barraba	2 000	Treated and released into a paddock that is leased out and used for agriculture.
Manilla	3 000	Reuse scheme that produces crops and pastures
Nundle	1 000	Septic only no reuse potential
Willow Tree	1 000	Septic only no reuse potential
Wallabadah	1 000	Septic only no reuse potential
Quirindi	5 000	Treated and released into a creek. Considering re-use options.
Werris Creek	2 500	Treated and released into Werris Creek, reuse is not being considered due to cost.
Currabubula	500	Septic only no reuse potential
Dungowan	500	Septic only no reuse potential
Carroll	<500	Septic only no reuse potential
Bendemeer	<500	Septic only no reuse potential
Guyra	2 000	Treated and some reuse for cut flower production

An EP or equivalent person includes an allowance for industrial activity, such as the processing of primary products, that uses a large volume of water and produces a corresponding large volume of effluent

Source: Hassall & Associates research

The following information was sourced from Hassall & Associates effluent reuse team based in Dubbo and is applicable to a sewage treatment plant treating wastewater from 3,000 EP. This size plant is reasonably typical of towns “treating and releasing” in the Nandewar:

- A 3,000 EP plant would generate 0.6 ML/day of wastewater. An irrigated timber plantation in the Nandewar would utilise 5-6 ML/ha per annum. Some 30 to 45 ha of plantation could be established.

- Establishment costs are site specific but typically proponents underestimate the requirement for ongoing maintenance of an effluent plantation.
- Timber produced will not be suitable for sawlog - trees grow rapidly under irrigation, pore space is enlarged and structural qualities are diminished.
- Timber produced will be of marginal value for pulping – based on experience of an Albury mill and effluent reuse project. Effluent grown wood was of poor quality and its use in a mill adjacent to the woodlot, with almost no transport costs, was marginally viable.
- Timber produced will be acceptable as firewood and while *Pinus radiata* is acceptable as firewood in some parts of the world, hardwood is suggested for NSW markets west of the Mountains.
- Long maturation periods of between 15 and 20 years make the economics of woodlots for firewood production difficult. To date, councils in western NSW have preferred annual crops and pastures, see table above.
- Annual crops and pastures have the advantage of both beneficially utilising wastewater and provide an opportunity to remove effluent nutrients long after plantations achieve “canopy closure” and cease to perform that role.

An opportunity assessment for effluent plantations is presented in the table below.

TABLE 2-H
***Assessment of Opportunities for Plantation
Irrigation with Effluent***

Resource availability	<ul style="list-style-type: none"> • Towns without reuse schemes are present in the Nandewar.
Markets	<ul style="list-style-type: none"> • Markets for firewood are available.
Employment created	<ul style="list-style-type: none"> • Minor.
Capacity to attract investors	<ul style="list-style-type: none"> • Non-commercial returns, assistance from local government required.
Scale of impact	<ul style="list-style-type: none"> • Small.
Skills available	<ul style="list-style-type: none"> • Both private and public skills available (eg CSIRO, NSW Agriculture).
Appropriate support infrastructure	<ul style="list-style-type: none"> • Little support infrastructure required.
Capacity to create opportunity for the Aboriginal Community	<ul style="list-style-type: none"> • No.
Community/Government support	<ul style="list-style-type: none"> • Community is likely to be supportive.
Government assistance required	<ul style="list-style-type: none"> • Yes, returns are not commercial.

2.6 RENEWABLE ENERGY INDUSTRIES – WIND FARMS

While not strictly a forest based industry, comment is provided on wind farms in the Nandewar at the request of the NEFA/WCA.

Wind farms have potential to supplement electricity generation on a commercial basis. Steps involved in selecting a site for a wind farm are:

- Site selection and wind monitoring – identification of one or more possible sites for development;
- Project feasibility – assessment of a single site in more detail, including environmental impact assessment requirements;
- Detailed assessment – complete a detailed environmental impact assessment;
- Planning application;
- Construction;
- Operation; and
- Decommissioning.

The NSW Sustainable Energy Development Authority (SEDA) provides regional wind reports that enable landholders to identify potential sites. Within and around the Nandewar Bioregion there are SEDA monitoring sites at Manilla, Tamworth, Walcha, Armidale and Glen Innes.

SEDA indicate that for every megawatt hour of capacity installed, NSW regional communities stand to benefit from an increase in employment from manufacturing (3-6 jobs), installation (0.5-0.8 jobs) and operation/maintenance (0.05 to 0.5 jobs) (SEDA 2002). Electricity generated can be sold into the NSW state electricity grid.

TABLE 2-I

***Assessment of Opportunities for Renewable
Energy – Wind Farms***

Resource availability	<ul style="list-style-type: none">• Sites to be selected using SEDA wind maps and reports.
Markets	<ul style="list-style-type: none">• NSW electricity grid.
Employment created	<ul style="list-style-type: none">• Moderate.
Capacity to attract investors	<ul style="list-style-type: none">• Commercial returns are feasible.
Scale of impact	<ul style="list-style-type: none">• Small to medium.
Skills available	<ul style="list-style-type: none">• Skills and advice available through SEDA.
Appropriate support infrastructure	<ul style="list-style-type: none">• Yes.
Capacity to create opportunity for the Aboriginal	<ul style="list-style-type: none">• No, unless a suitable site can be identified on Aboriginal land.

Community	
Community/Government support	<ul style="list-style-type: none"> Community and government likely to be supportive of alternative energy sources where viable.
Government assistance required	<ul style="list-style-type: none"> No.

Commercial viability will be dependent on the suitability of individual sites.

2.7 APIARY PRODUCTS – INCL. NATIVE BEES

Opportunities Linked to the BBSB

Economic development opportunities identified in the BBSB are relevant to Nandewar; apiarists work in both regions. BBSB apiary opportunities included:

- Regional branding;
- Co-product development;
- Tourist attractions; and
- Additional packaged bee exports and pollination service sales.

Each of these opportunities is examined in the table below.

TABLE 2-J

***Assessment of Opportunities for Further
Development of the Apiary Sector – Conclusions
from the BBSB***

Resource availability	<ul style="list-style-type: none"> Continued access to forest resources is a major issue for the NSW apiary industry. Continued growth of success stories like live bee exports is dependent on keeping sites/access. Native forests provide an important reserve for replenishing bees after provision of pollination services. BBSB/Nandewar forests are also remote and therefore provide opportunities for marketing “chemical free” product.
Markets	<ul style="list-style-type: none"> Nationally there is a shortage of honey at the current time. Growth in horticultural crops eg almond production, are anticipated to generate additional demand for pollination services. Bees need to over-winter in areas like the BBSB/Nandewar 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.

	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Incremental employment possible, especially through growth of packaged bee exports. Apiarists indicate that lack of training limits new entrants.
Capacity to attract investors	<ul style="list-style-type: none"> • Potential for new apiary operations.
Scale of impact	<ul style="list-style-type: none"> • Significant growth possible.
Skills available	<ul style="list-style-type: none"> • Skills available in the region. Additional skilled workers would add to industry strength, as would improved access to training and extension. • Research and development required for products such as medi-honey and bee nutrition.
Appropriate support infrastructure	<ul style="list-style-type: none"> • Road access to remote sites and maintaining access to existing sites is important to future growth.
Capacity to create opportunity for the Aboriginal Community	<ul style="list-style-type: none"> • Potential for Aboriginal involvement in the industry. • Employment with export bee operations possible. • 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. • Limited interest in apiary was expressed at Aboriginal consultation meetings in the Nandewar.
Community/Government support	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Security of resource access 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. Nandewar provides similar opportunity on a smaller scale. Resource access is critical. It is noted that NPWS is developing appropriate policies in regard to continuation of existing permits.

In addition to these opportunities evaluated as part of BBSB investigations, the NEFA/WCA have suggested native bee production. This opportunity is evaluated in the section below.

Native Bee Production Opportunities

There are over 1,500 species of Australian native bees. Most Australian bees are solitary bees, which raise their young in burrows in the ground or in tiny hollows in timber. Australia also has 10 species of stingless, social native bees (genera *Trigona* and *Austroplebeia*). These stingless bees produce honey⁶.

Stingless native bees are a primitive species that only produce small amounts of honey. In warm areas of Australia, honey production is possible e.g. Queensland and northern NSW. In cooler areas of Australia, native bees can generally only produce sufficient honey for their own survival. Harvesting of honey in these cooler areas is not recommended⁷.

The native bee industry is still very much in its infancy with limited production data available. A honey industry based on native bees is possible in the Nandewar region due to its warm climate. However, production of honey is likely to be lower than from European bees. Therefore it is necessary to have a premium attached to native bee honey in order for it to be competitive with European bee production. Anecdotal evidence suggests “farm gate” values for Australian native bee honey of up to \$100/kg (BBSB consultation workshops). Heard and Dollin, 2000 (in Syneca 2000) reported an industry where:

- Native bee honey achieved an average wholesale price of \$40/kg⁸;
- Native bee hives sold are at an average price of \$200 each; and
- Cerumen, a nest construction material used in Aboriginal handcrafts and medicine, also found a market.

Heard and Dollin (2000) estimated the Australian native bee industry at 257 beekeepers and 1,429 colonies.

A privately funded organisation, The Australian Native Bee Research Centre, has been formed and is based in the lower Blue Mountains, west of Sydney, NSW. It publishes information booklets, field guide, video and other products. The organisation’s mission statement is “Promoting the Preservation and Enjoyment of Australian Native Bees”.

An assessment of native bee production opportunities is provided in the table below.

⁶ Aussie Bee Website, 3 November 2003, <http://www.zeta.org.au/~anbrc/index.html>

⁷ Aussie Bee Website, 3 November 2003, <http://www.zeta.org.au/~anbrc/index.html>

⁸ Conventional honey sourced from European Honey Bees presently wholesales for between \$4/kg and \$5/kg and these prices are high due to drought induced shortages (NSW Agriculture advice).

TABLE 2-K

Assessment of Opportunities for Native Bee Production

Resource availability	<ul style="list-style-type: none"> Nandewar offers a warmer climate suitable for native bee honey production. Native bees can be expected to perform important pollination services for native and exotic plants (Syneca 2002).
Markets	<ul style="list-style-type: none"> Markets are emerging for native bee honey, beehives and cerumen.
Employment created	<ul style="list-style-type: none"> Modest.
Capacity to attract investors	<ul style="list-style-type: none"> Limited.
Scale of impact	<ul style="list-style-type: none"> Small.
Skills available	<ul style="list-style-type: none"> Research and development required including adaptation of European bee keeping skills to native bee requirements.
Appropriate support infrastructure	<ul style="list-style-type: none"> Available through both the public sector and not for profit organisations like the Australian Native Bee Research Centre.
Capacity to create opportunity for the Aboriginal Community	<ul style="list-style-type: none"> Some potential.
Community/Government support	<ul style="list-style-type: none"> Community is likely to be supportive.
Government assistance required	<ul style="list-style-type: none"> Assistance with research and development would be beneficial to industry development.

The opportunity is a relatively minor one requiring additional research and development.

2.8 WILD HARVEST – OILS, SEEDS, FOLIAGE, ETC

Potentially there are forest development opportunities linked to the sustainable harvest, preparation/processing and marketing of a range of native forest products originating in the public and private forests of the Nandewar. In the BBSB there is a CDEP harvest of broombush suitable for fencing and timber suitable for didgeridoos. Harvesting of native cut flowers and foliage from native sources is illegal and this opportunity would be best addressed through farming in a plantation (see section below).

While extraction of essential oils from native forest species could be used for a range of products, such as soaps, waxes and perfumes, it is unlikely that the forests of the Nandewar offer any unique sustainable comparative advantage not available elsewhere in NSW. Furthermore, the Nandewar is not part of a major forest based tourism industry, like the NSW North Coast for example. The viability of essential oil extraction and value adding would be greatly enhanced by the potential for local “cellar door” style sales.

Other opportunities linked to the “wild harvest” of forest products include:

- Bushfood collection, processing and sale;
- Bush medicine collection, processing and sale; and
- 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 the chapter addressing opportunities for the Nandewar Aboriginal community.

2.9 SHORT-ROTATION CROPS OF NATIVE SPECIES –FLOWERS AND NURSERY

This group of opportunities includes short rotation crops based on native species grown as either cut flowers or nursery products. These opportunities were hampered in the BBSB by distance to markets i.e. approximately 400 km to Sydney and 850 km to Brisbane and Melbourne. The Nandewar Bioregion is closer to capital city markets, is better served by transport and has Tamworth, a major regional centre, at its heart. These opportunities are addressed on first principles in Chapter 3.

2.10 NATIVE MEATS

In addition to floral resources, the forests of the Nandewar are also home to a range of native and feral fauna suitable for human and pet food consumption. Populations in excess of sustainable levels, especially for introduced species provide opportunity for game meat harvesting. In addition the NSW Government has recently introduced the Game Meat Act as a means of productively controlling feral animals on public lands. Opportunities to harvest are tendered to members of the public. Target species include:

- Feral pigs;
- Feral goats;
- Kangaroos; and
- Emus.

Feral pigs are harvested by both landholders and visiting recreational shooters. A commercial infrastructure exists for the collection of feral pigs harvested in this way and markets, including export markets, are available for resultant product. Feral goat harvesting has developed into an important income supplement for landholders during periods of low commodity prices and drought. As with feral pigs commercial infrastructure is available for the processing and marketing of both feral goat meat and goats for domestication.

The harvesting of native species is strictly controlled by the NSW NPWS and a policy on commercial and non-commercial cull is in place. Nandewar is not as prospective for kangaroo harvest as other parts of the state (e.g. NSW Western Division). The NPWS also license the taking of emus for meat, oil and feather breeding stock. During the late 1980s emu farming enjoyed a brief period of popularity before markets were oversupplied and farming was constrained by high grain prices and slaughter costs.

An assessment of native meat production opportunities is provided in the table below.

TABLE 2-L
Assessment of Opportunities for Native Meat Harvesting

Resource availability and sustainability	<ul style="list-style-type: none"> Feral pigs and goats available but kangaroos and emu are more plentiful in other parts of NSW. Commercialisation may result in a situation where it is more attractive to retain rather than remove feral species.
Markets	<ul style="list-style-type: none"> Markets are established for native meat products. Markets are fickle and oversupply is potentially problematic.
Employment created	<ul style="list-style-type: none"> Modest.
Capacity to attract investors	<ul style="list-style-type: none"> Limited.
Scale of impact	<ul style="list-style-type: none"> Small to medium.
Skills available	<ul style="list-style-type: none"> Skills are available within the bioregion.
Appropriate support infrastructure	<ul style="list-style-type: none"> Commercial infrastructure available for goat and pig meat harvest.
Capacity to create opportunity for the Aboriginal Community	<ul style="list-style-type: none"> Some potential, sustainable harvest and eradication of feral populations consistent with a "management of country" approach.
Community/Government support	<ul style="list-style-type: none"> Community is likely to be supportive of feral animal control. Commercialisation of native species is potentially divisive and inconsistent with the views of some community members.
Government assistance required	<ul style="list-style-type: none"> No.

Nandewar offers no comparative advantage in the harvest of kangaroo and emu meat. Infrastructure is in place for wild pig meat and goat meat production. Further opportunity is considered to be minor.

2.11 GRAZING

As noted in Chapter 1, given the low quality of grazing in the forests of Nandewar there is limited opportunity for additional grazing. No further consideration is given to grazing as a forest based development opportunity.

2.12 INTEGRATED RESOURCE MANAGEMENT AND RECOVERY

The NEFA/WCA suggest a forest management program based around integrated natural resource management and recovery. The program would be inclusive of threatened species recovery, invasive species control and degraded area rehabilitation. It is envisaged that the program would be consistent with National Heritage Trust (NHT), Landcare, Greening Australia and even Green Corps initiatives. The program would also be similar to the cypress regrowth thinning proposal detailed above but would not generate products for sale on conventional markets (eg cypress oil, trellising, firewood briquettes, garden composts and so on). Program “products” would focus on environmental improvement and potentially, in the longer term, provide ecosystem services for emerging salinity/carbon markets.

An assessment of integrated natural resource management and recovery opportunities is provided in Table 2-M.

TABLE 2-M

***Assessment of Opportunities for Integrated
Natural Resource Management and Recovery***

Resource availability and sustainability	<ul style="list-style-type: none">Threatened species recovery, invasive scrub control (including cypress regrowth) and degraded vegetation are present in the bioregion.It is not known whether action on resource recovery is more pressing in this bioregion than in other areas of NSW.
Markets	<ul style="list-style-type: none">Environmental goods are not currently traded.
Employment created	<ul style="list-style-type: none">Moderate to large depending on the scale of program adopted.
Capacity to attract investors	<ul style="list-style-type: none">Limited, philanthropic investment only.
Scale of impact	<ul style="list-style-type: none">Small to medium.
Skills available	<ul style="list-style-type: none">Skills are available within the bioregion. Skilling is consistent with CDEP initiatives.
Appropriate support infrastructure	<ul style="list-style-type: none">Limited support infrastructure required and available through government agencies.

Capacity to create opportunity for the Aboriginal Community	<ul style="list-style-type: none"> • Yes and consistent with “management of country”.
Community/Government support	<ul style="list-style-type: none"> • Community is likely to be supportive. Government is likely to see a high level of overlap with existing initiatives.
Government assistance required	<ul style="list-style-type: none"> • Yes.

The idea behind this opportunity is at least partially covered by existing Commonwealth programs that span everything from NHT to CDEP. The idea is also consistent with elements of the proposed cypress-thinning program, especially those elements of the cypress-thinning proposal that are directed at improved biodiversity.

Additional investment in integrated natural resource management and recovery through this program would have limited funding appeal.

2.13 TOURISM AND RECREATION

Forest based tourism and recreation are potential growth industries that offer opportunities to regional communities to slow or even halt the loss of jobs associated with the restructuring of traditional employers. Tourism and recreation services are generally labour intensive, the skills for employment can in many cases be readily acquired, activities are sustainable (if properly managed) and some opportunities require relatively small investments (Syneca 2002).

Forest based tourism and recreation opportunities in the Nandewar are driven by the region’s comparative advantage (gemstone fossicking and bird watching) and are mindful of other regional links. Important regional links include special events that attract large numbers of visitors to the region (such as the Tamworth Country Music Festival and AgQuip Gunnedah) and existing and proposed initiatives (such as backpacking in Inverell and the proposed cultural heritage centre in the BBSB). Forest based tourism and recreation is estimated to capture as little as 1.5% of total visitation to the region.

There are a number of significant local events (eg. Ag-Quip field day at Gunnedah, or country music festival at Tamworth) that hold considerable interest for people outside (and inside) the region bringing in many tourists. In evaluating or promoting opportunities, it would be worthwhile considering leveraging off major events, also ensuring that these are high quality products attracting visitors to stay longer in the area.

The following opportunities were identified during consultation and subsequent research:

- New campgrounds in State Forests: A partnership approach to developing recreation and tourism in under-utilised State Forests. These forests contain suitable attractions but lack appropriate infrastructure and access;
- Funding for tourism infrastructure: Infrastructure may be as simple as signposted walks and interpretive material or as significant as new or upgraded roads;

- Maps and guides: Maps and guides to further extend the reach of successful regional initiatives such as Barraba/Manilla bird watching and the Fossickers Way;
- Tours and trails: Integration of fossicking and bird watching opportunities into the proposed offering of the Baradine Cultural Heritage Centre, Camp Cypress and other regional attractions (such as Gunnedah Red Chief Museum);
- Tours and trails: Tours and Eco-tourism to take advantage of unique and distinctive areas like the Nandewar ranges and provide a continuum of attractions between the north coast, the Pilliga, Tamworth and Dubbo;
- Tours and trails: Extension of “Oz Experience” style backpacker bus tours to incorporate additional regional attractions and a longer stay in the Nandewar; and
- Strategy: Development of a regional tourism strategy to ensure integration and coordination of initiatives. The initiative would include strategies for nature-based tourism, school camps (like Camp Cypress) and other eco-friendly forms of tourism. Development of a region wide tourism strategy was suggested by the NEFA/WCA. Tourism opportunities could also be leveraged off the major events held in the region (eg. Ag-Quip field day at Gunnedah, or country music festival at Tamworth).

These opportunities are linked and interdependent. Most are linked to initiatives in the BBSB. An explanation for each opportunity, along with an assessment based on selected criteria analysis is presented below.

New Camping Grounds in State Forests

A number of Nandewar State Forests front the McIntyre and Gwydir Rivers and if access could be negotiated with private landholders attractive camping sites could be developed. These sites would offer high quality Murray cod fishing and bushwalking experiences. Ideally these campsites would be developed in partnership with local landholders who would add to the opportunity by offering farm-stay accommodation and experiences. The opportunity is valid regardless of whether the tenure of the state forest is with SFNSW or NPWS. An assessment of this opportunity is provided in Table 2-N.

TABLE 2-N

***Assessment of Opportunities for New Camping
Grounds in State Forests***

Resource availability and sustainability	<ul style="list-style-type: none"> Yes, potential camping sites are possible provided access can be secured.
Markets	<ul style="list-style-type: none"> It is suggested that with more than 700,000 visitors per annum to the Nandewar and less than 2% visiting a forest that with appropriate marketing a new camping area would find a market. Market research and marketing strategies would need to target integration of this opportunity into the existing tourist offering.
Employment created	<ul style="list-style-type: none"> Small to moderate. Would require public sector employment to manage and maintain and some local labour during construction.
Capacity to attract investors	<ul style="list-style-type: none"> Limited, proposed area is part of the crown estate and investment would need to originate in the public sector. SFNSW have indicated some interest in a partnership approach to recreation and tourism in the Nandewar.
Scale of impact	<ul style="list-style-type: none"> Small.
Skills available	<ul style="list-style-type: none"> Skills are available within the bioregion in both SFNSW and the NPWS.
Appropriate support infrastructure	<ul style="list-style-type: none"> Improved road access may be required at proposed sites.
Capacity to create opportunity for the Aboriginal Community	<ul style="list-style-type: none"> Potentially through ranger and management positions associated with public sector employment as a result of this and other initiatives.
Community/Government support	<ul style="list-style-type: none"> Community is likely to be supportive. Landholder support will be critical.
Government assistance required	<ul style="list-style-type: none"> Yes.

While a more in depth feasibility study is required that would include detailed visitation forecasting, assessment of competing sites (including the extent to which new camp sites will “cannibalise” the existing NPWS offering), consultation with landholders and identification of specific locations, this opportunity would appear to have merit and is recommended for further consideration.

Tourism and Recreation Infrastructure – walking trails, road signs and roads

Linked to the previous tourism and recreation opportunity is the need for tourism infrastructure in the bioregion. Tourism infrastructure might be as low cost as signage for walking trails or might involve major road building to secure acceptable access to attractions and campsites. This option was investigated as part of the BBSB opportunity assessment and consultation revealed the following public sector funding priorities.

- 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” and road signs within the Pilliga. Currently, navigation in the Pilliga is challenging. Assistance from SFNSW may be appropriate for this form of investment;
- Roads to improve tourism access. Specifically Tourist Drive No 2 needs upgrading. Funding could be sort from SFNSW and local government; and
- Camping grounds that meet not only the basic needs of “white wanderers” but also family groups who seek showers, toilets and drinking water.

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 RFA.

These BBSB requirements are consistent with needs in the Nandewar.

Maps and Guides

Maps and guides to further extend the reach of successful regional initiatives such as Barraba/Manilla bird watching and the Fossickers Way are suggested. This option was also investigated as part of the BBSB. Additional maps and guides of value in the Pilliga and Goonoo would include:

- A wildlife map highlighting known fauna 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; and
- Funding for these map and guide upgrades may be available from the Department of State and Regional Development, local councils and SFNSW.

Map and guide proposals for the BBSB are relevant to the Nandewar.

Collaborative Tours

Collaborative tours involving local community groups (bird watching), Indigenous communities, NPWS and SFNSW were flagged by SFNSW during consultation for NAND11. Tours and eco-tourism would take advantage of the unique and distinctive areas of the bioregion and provide a continuum of attractions with neighbouring areas like the BBSB and the north coast. Tours could be integrated and promoted alongside the offering of the proposed Baradine Cultural Heritage Centre, Camp Cypress (for school children) and other regional attractions (such as the Red Chief Museum at Gunnedah). Tours could be offered as an

extension of the current “Oz Experience” backpacking. An opportunity assessment for collaborative tours is provided in Table 2-O.

TABLE 2-O
***Assessment of Opportunities for Collaborative
Tours***

Resource availability and sustainability	<ul style="list-style-type: none"> • Yes, attractions are of sufficient quality to attract visitors.
Markets	<ul style="list-style-type: none"> • Market research and marketing strategies would need to target integration of this opportunity into the existing tourist offering. Links to major Nandewar events (Country Music and AgQuip) are suggested.
Employment created	<ul style="list-style-type: none"> • Small to moderate. Would require public sector employment.
Capacity to attract investors	<ul style="list-style-type: none"> • Limited.
Scale of impact	<ul style="list-style-type: none"> • Small to medium.
Skills available	<ul style="list-style-type: none"> • Skills are available some training in tour guiding may be required.
Appropriate support infrastructure	<ul style="list-style-type: none"> • Yes.
Capacity to create opportunity for the Aboriginal Community	<ul style="list-style-type: none"> • Aboriginal guide potential.
Community/Government support	<ul style="list-style-type: none"> • Community is likely to be supportive.
Government assistance required	<ul style="list-style-type: none"> • Yes.

The opportunity requires good quality market research prior to further advancement.

Development of a Regional Tourism Strategy

As part of project consultation it was suggested that a region specific integrated tourism strategy be prepared. The strategy would include nature-based, cultural, school camps and other eco-friendly forms of tourism (particularly bird-watching).

A regional strategy has merit. However, the merit of establishing another overlay of integration to comply with the boundaries of the Nandewar is questionable. Nandewar eco tourism, school camps and cultural tours would be better managed and promoted as part of existing structures (eg Tourism New South Wales Big Sky Network) or as part of a “greater BBSB” initiative.

2.14 PRIORITY OPPORTUNITIES

A summary of the ranking of forest based development opportunities is provided below.

TABLE 2-P

Priority Opportunities for Forest Development

Opportunity	Priority Ranking and Summary Comment
Cypress industry - further processing	<ul style="list-style-type: none"> High priority, opportunity to be explored in tandem with the BBSB. Opportunity regarded as being of higher importance than FISAP assistance. Pre-finishing of timber suggested.
Supplementary cypress thinning	<ul style="list-style-type: none"> High priority, opportunity is consistent with Red Chief LALC business case. Opportunity first proposed in BBSB.
Tourism and recreation – new camp grounds in State Forests	<ul style="list-style-type: none"> High priority, forests fronting the McIntyre and Gwydir Rivers offer potential if access can be negotiated.
Cypress industry – export opportunities	<ul style="list-style-type: none"> High priority, further processing to better service the Japanese market. Medium priority, follow QLD industry into the US market.
Cypress industry – silviculture	<ul style="list-style-type: none"> Medium – high, supplementary cypress thinning.
Apiary – commercial	<ul style="list-style-type: none"> Medium priority, with necessary resource security sector will continue to grow.
Tourism and recreation – walking trails, road signs and access roads	<ul style="list-style-type: none"> Medium priority, to be considered as part of a package with BBSB.
Tourism and recreation – maps and guides	<ul style="list-style-type: none"> Medium priority, to be considered as part of a package with BBSB.
Tourism and recreation – collaborative tours	<ul style="list-style-type: none"> Medium priority, the opportunity requires good quality market research prior to further advancement.
Cypress industry – by-products	<ul style="list-style-type: none"> Medium, cypress oil for improved pest resistance and strength in structural timber. Medium, firewood briquette manufacturing. Medium, utilise waste to part fuel an ethanol production plant. Medium, cogeneration of electricity from mill by-products – subject to confirmation of the commercial feasibility of gasifier technology.
Renewable energy industries – wind farms	<ul style="list-style-type: none"> Low priority, dependent on commercial viability as determined by the suitability of individual sites.
Hardwood timber products	<ul style="list-style-type: none"> Low priority, a commercial hardwood resource is not available in the Nandewar.

Apiary – native bee	<ul style="list-style-type: none"> • Low priority, the opportunity is a relatively minor one requiring additional research and development.
Tourism and recreation – regional tourism strategy	<ul style="list-style-type: none"> • Low priority, risk of duplication exiting structures.
Plantations irrigated with effluent	<ul style="list-style-type: none"> • Low priority, other effluent reuse crops preferred.
Native meats	<ul style="list-style-type: none"> • Low priority, local advantage in kangaroo and emu meat. Infrastructure already in place for wild pig and goat.
Grazing	<ul style="list-style-type: none"> • Low priority, the forests of the Nandewar offer limited opportunity for additional grazing.
Integrated natural resource management and recovery	<ul style="list-style-type: none"> • Low priority, idea overlaps existing Federal programs and cypress thinning proposal. Idea further developed in conservation incentive chapter.
Plantations, woodlots and agro-forestry	<ul style="list-style-type: none"> • Low priority, rainfall/soil are sub optimal, difficulty in competing with agricultural enterprises in better areas.
Tourism and recreation – aquatic tourism	<ul style="list-style-type: none"> • Low priority, aquatic tourism (Keepit, Split Rock, Copeton, and Pindari Dams). Highly dependent on water level. Some tours already carried out, anything further requires good quality market research prior to further advancement.
Wild harvest – oils, seeds, foliage, etc	<ul style="list-style-type: none"> • Considered in detail in Chapter 3.
Short rotation crops – flowers and nursery	<ul style="list-style-type: none"> • Considered in detail in Chapter 3.

3

Opportunities for the Aboriginal Community

3.1 INTRODUCTION

This section of the report allows for specific consideration of those opportunities not reviewed in Chapter 2 that are identifiably Indigenous in content and ownership or require further detailed explanation.

Many of the identified opportunities were also considered in the BBSB assessment of Aboriginal Opportunities. The relevance of these opportunities to the Nandewar however, was considered in a series of meetings and follow up interviews with representatives of the Aboriginal Community within the Nandewar Bioregion. A list of persons contacted is provided in Chapter 8.

This chapter presents an overview of Nandewar Indigenous social profiling completed in NAND11 along with a review of major issues identified during consultation before “long-listing” and evaluating specific opportunities. Opportunity identification and “long-listing” is confined to forest based opportunities. Opportunities for cattle feedlotting, sheep production, horticulture and fish farming identified by Aboriginal people during consultation are not developed in this report.

3.2 SUMMARY OF NAND11 INDIGENOUS SOCIAL AND ECONOMIC PROFILING

An Indigenous social profile of the Nandewar was prepared as part of NAND11. Key statistics and conclusions drawn from selected profiles relative to the NSW rural average included:

- The Aboriginal and Torres Strait Island population of the Nandewar was 3,769 in 2001 or 5% of the total population. The percentage of Indigenous people in the population is a little higher than the rural NSW average (3.7%).
- The Indigenous population grew by around one third during the 1990s.
- Age dependency i.e. the proportion of people below and above working age is higher than the NSW average in the Nandewar Indigenous community and is highest in Bingara, Inverell, Parry and Tamworth.
- The majority of the Indigenous population of the Nandewar live in the Tamworth area (59%), Inverell (20%) and Parry (13%).

- Indigenous people in the Nandewar have lower than average school retention rates and lower numbers of people with qualifications. Indicators are typical for Indigenous people in NSW and are lower than average for balance of rural NSW.
- The Indigenous unemployment rate in the Nandewar was 35% in 2001 down from 37% in 1996. Indigenous unemployment is still unacceptably high when compared to the general population rate of 9% for the Nandewar and 11% for rural NSW.
- The number of one-parent families, persons separated or divorced and persons living in rental accommodation are higher than the rural NSW average.

3.3 ISSUES RAISED IN CONSULTATION

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

- Continued access to working forests is important to our communities - sustainable harvest not take all the big trees.
- “Real jobs” are what is required, ones with potential to last rather than short-term government program generated opportunities.
- Our people cannot live by culture alone.
- We need leaders to get in and set up employment opportunities, ones that can find investment.
- Employment to provide opportunities for our old people to make them feel valuable.
- Think of us for sizable investments don’t just think of us for nuts and berries.
- Opportunities need to consider family and opportunity that are local.
- Opportunities need to consider skills available in local communities.
- Look at the plantation potential of Land Council holdings there is a lot of land in the Nandewar held by Local Aboriginal Land Councils.
- Highlight opportunities for which there is both skill and interest these are the ones that will work.
- Heritage and tours are not going to put food on the table.
- Culture is more than “stones and bones” it’s about medicine, language and dance.
- Local artefacts are unique they can be “branded” as Nandewar or given the traditional name for the area.
- The “cultural capital” remains in place in the Nandewar.

These comments along with the information provided in the socio-economic profiling and the criteria used to evaluate opportunities in Chapter 2 are used to assess opportunities for the Nandewar Aboriginal community.

3.4 LONG LIST FOR CONSIDERATION

Opportunities that are identifiably Indigenous in content and ownership include:

- Supplementary Cypress Thinning;
- A large Scale Investment in a Cypress Mill;
- Plantations/Nurseries on Aboriginal Owned Land;
- Greenwood Firewood Industry;
- Bushfoods, Medicines and Seeds;
- Commercial Apiary;
- Indigenous Cultural Heritage Centre;
- Art and Craft of the Region, Production and Retailing;
- Aboriginal Cultural Heritage⁹/Ecology Tourism;
- Aboriginal Studies;
- Data Management Business for Indigenous Intellectual Property;
- Aboriginal Involvement in Culturally Significant Sites¹⁰; and
- Site Assessment Consultancy Services and/or Public Sector Employment.

These opportunities are detailed below.

3.5 SUPPLEMENTARY CYPRESS THINNING

Supplementary cypress thinning, funded with government grant money and the utilisation of thinnings for a range of commercial and semi commercial opportunities has its origin in a proposal tabled by the *Friends of the Pilliga* in BBSB consultation workshops. The original proposal was based around additional thinning of small “locked stand” cypress to encourage diversity of habitats and, in time, cypress suitable for commercial milling.

The proposal was reviewed in the *Assessment of Forest Based Opportunities* study for the BBSB (RACAC 2002) and provided with a “high importance” ranking. The report concluded: “The proposal 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”.

⁹ Cultural Heritage is a key responsibility of SFNSW on Forestry Estate.

¹⁰ DEC has legislative responsibilities and management policies toward the management of Aboriginal objects and places throughout the State.

Syneca Consulting in their report for the Western Conservation Alliance (Syneca Consulting 2002) concluded “thinning cypress regrowth would have considerable impacts on the economy and, possibly, determine the long-term viability of the cypress industry. But it does require substantial ongoing external funding.”

Since the 2002 BBSB investigations the *Friends of the Pilliga* proposal has been embraced by Red Chief Local Aboriginal Land Council (Beale 2003) and expanded to include a range of activities and products including:

- Supplementary cypress thinning;
- Cypress oil production;
- Mine prop production;
- Strainer posts for fencing;
- Vineyard trestles;
- Garden mulches; and
- Firewood briquettes.

The Red Chief proposal is well supported across the gambit of BBSB-Nandewar stakeholders. These include the Aboriginal community of the region, State Forests and Gunnedah Shire Council (subject to a full cost assessment), Country Women’s Association, Brigalow Regional United Stakeholders, Pilliga Land Users Group, Western Conservation Alliance, NSW Farmers, Friends of Pilliga (qualified and excluding thinning in national parks and any resultant increase in logging in other areas) and Gunnedah Timbers (highlighting market potential and offering to assist with a feasibility study).

The next step with this proposal is a comprehensive feasibility study and detailed market research for the proposed products. The feasibility study should detail the extent of government assistance required and be mindful of the projects objectives. At the current time the proposal is heavily geared towards employment generation at the potential cost of commercial viability. This gearing is an acceptable objective but should be clearly stated in the feasibility study. The initiative, with its origin in the BBSB, should be expanded to include harvest areas in the Nandewar.

3.6 A LARGE SCALE INVESTMENT IN A MILL

This opportunity arose during consultation with Aboriginal stakeholders. The proposal was that Aboriginal people should examine the opportunity to secure a supply of cypress sawlog and establish their own mill. Advice from SFNSW is that the sustainable yield of cypress in both the Nandewar and the BBSB is fully committed and that while opportunities to purchase entitlement do arise from time to time, bidding capacity would favour existing mills adding to current throughput. An alternative would be to compete for private native forestry resource.

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, investors would need to consider whether this was the best use of investment funds. The particular cypress milling opportunity presented would need to be benchmarked against other investments available at the time on criteria such as commercial returns and capacity to offer employment levels for Aboriginal people. No immediate opportunity presents. A large-scale investment in a cypress mill in the Nandewar is ranked poorly at this particular time.

3.7 PLANTATIONS/NURSERIES ON ABORIGINAL OWNED LAND

Local Aboriginal Land Councils (LALC) control a considerable area of land in the Nandewar. These land parcels are often not used for productive purposes. Typically, Land Councils manage small parcels of land that were formerly part of the Crown Estate (eg former travelling stock routes). Parcels are usually less than 30 ha and are rarely contiguous. Their viability as stand alone agricultural holdings is limited.

It has been suggested that these small parcels of land would be suitable for plantations or nurseries for the raising of native plants. Land set aside for a long-term use, such as native vegetation regeneration or, possibly even a plantation, is eligible for concessional local government rates and this might assist with the viability of a plantation/nursery enterprise.

While the Nandewar was shown to be sub-optimal for plantation establishment in Chapter 2 of this report, some long-term income from otherwise unproductive land may be beneficial to Indigenous communities. Where larger and more fertile tracts of land are controlled by LALCs (such as the 1,800 ha of land owned by the Tamworth LALC at Somerton), other potentially higher yielding enterprises (like prime lamb production) need to be considered.

Potentially, native plant nurseries are viable in areas where there are mines requiring rehabilitation or where SFNSW are replanting. There are 6,000 native species suitable for production in an area like the Nandewar and SFNSW have indicated a preparedness to assist with nursery establishment.

An opportunities assessment for plantations/nurseries is provided below.

TABLE 3-A

***Opportunities Assessment for
Plantations/Nurseries on Aboriginal Owned Land***

Resource availability and sustainability	<ul style="list-style-type: none"> Land controlled by LALCs is available, site-specific agronomic, market and alternative use assessments are required. Rainfall and soils are sub-optimal.
Markets	<ul style="list-style-type: none"> Markets are available. Distance to markets is an issue but is more manageable than BBSB.
Employment created	<ul style="list-style-type: none"> Small to moderate. Nurseries could be very labour intensive.
Capacity to attract investors	<ul style="list-style-type: none"> Reliant on assistance from public sources.
Scale of impact	<ul style="list-style-type: none"> Small to medium.
Skills available	<ul style="list-style-type: none"> Some Aboriginal people have training in horticulture.
Appropriate support infrastructure	<ul style="list-style-type: none"> Yes, especially for conventional products such as firewood and mill timber.
Community/Government support	<ul style="list-style-type: none"> Community is likely to be supportive.
Government assistance required	<ul style="list-style-type: none"> Yes.

This opportunity has merit subject to site-specific investigations. An audit of LALC sites for suitability is suggested.

3.9 GREEN WOOD FIREWOOD INDUSTRY

CDEP programs in the BBSB include the harvesting of dead wood from State Forests for firewood. An opportunity was identified in the BBSB to utilise thinnings and waste products from State Forests to establish a green wood based industry.

The green wood based industry would be more consistent with government policy restricting the harvesting of dead wood, especially dead wood with hollows. Income earned by Aboriginal people through CDEP programs is currently at risk if an alternative to dead wood cannot be found.

There is insufficient harvesting activity in the Nandewar to establish a “stand-alone” greenwood industry but thinnings and waste from Nandewar forests would add to the “critical mass” of a BBSB industry. Aboriginal CDEP groups based in Moree already make some use of Nandewar forests.

Use of thinnings and waste for firewood would need to be weighed against other productive uses for this resource (oil extraction, briquette manufacture, etc) evaluated in the previous chapter.

3.10 BUSH FOODS, BUSH MEDICINES AND SEEDS

Aboriginal people met during project consultation expressed interest in developing small-scale businesses based on locally distinct bush food/bush medicine and seed collection, propagation, processing and sale. They explained that local plants are different to plants in other regions and were applied by local people in unique ways. Plants and uses are different between areas as close as the Nandewar and BBSB.

DEC noted that whilst cultural values maybe strong, the use and knowledge of Elders they interviewed in the Nandewar were lacking in the area of bush foods and medicines. In DEC's Aboriginal Community Consultation Draft Report it was stated that:

Some of the Elders and community people interviewed stated that they have not tasted a lot of "bush tucka" foods, including kangaroo and emu. Most of the fruits and berries identified during the surveys by "Brownie" were thought to be poisonous or the "old people" telling them "not to touch".

"As you must appreciate its hard to find people with knowledge and understanding of bush foods and medicines in the area due to loss of their traditional lands to agriculture and farming. Most of the western tablelands Aboriginal people, sad but true know a little about these foods and medicines as the white man has been in the area for a considerable time, possibly as early as eighteen forties or fifties."

"Those who were forced onto missions and reserves were "supplied" with whiteman food therefore they had no need to gather or hunt traditional foods, anyhow they weren't allowed to, they would have been punished in some way or another." Ian Brown 2004.

This would tend to suggest that a considerable amount of local knowledge has been lost over the years. However, information on plant locations and abundance is being collected by NSW government agencies as part of the Nandewar assessment. Local Aboriginal people proposed that a regionally distinct brand could be established and products marketed on the basis of this brand. CDEP funds could be tapped to develop product and brand. Retailing could be through channels such as the proposed Cultural Heritage Centre at Baradine.

A favourable assessment based on the selected criteria was made for bush foods, medicines and seeds in the BBSB opportunity assessment study. This opportunity should be carried forward for the Nandewar. The opportunity is best served if the Baradine Cultural Heritage Centre (or equivalent) is established and an appropriate market outlet provided.

3.11 APIARY

Aboriginal people expressed an interest in participating in commercial apiary in the BBSB. Training and skills exchange could be traded for access to bee sites on LALC land. No such interest was expressed in commercial apiary or native bee apiary in the Nandewar.

3.12 INDIGENOUS CULTURAL HERITAGE CENTRE

All Indigenous groups consulted as part of the Nandewar indicated an interest in a local Aboriginal Cultural Heritage Centre to showcase local artefacts, teach Indigenous knowledge and provide a place that fostered pride. When asked if they would support the proposed Baradine Cultural Heritage Centre (see BBSB investigations) persons contacted indicated that they would. Some questioned the remoteness of Baradine and its position outside major transit routes. It is worth noting that Red Chief LALC have a museum space in Gunnedah.

A cultural heritage centre would serve as a focal point that could be expected to generate a range of associated opportunities for the Aboriginal community including:

- Cultural heritage tourism;
- Arts and crafts;
- Bushfoods; and
- Aboriginal studies.

Such a centre could also provide for sharing of knowledge and skills development that would assist local community (including Aboriginal Partnership Committees) participation in the identification, assessment and management of cultural heritage sites. The involvement of relevant Aboriginal communities could be obtained through co-management agreements.

3.13 ART AND CRAFT, PRODUCTION AND RETAILING

The Red Chief LALC proposes that didgeridoos could be treated and painted in Gunnedah by the CDEP and retailed through the land council's museum. The opportunity is constrained by a lack of source material in the local area and supplies from further west are limited. The opportunity is in part dependent on continued access to forests like the Pilliga.

While the retailing of didgeridoos has commercial potential it was pointed out during consultation that didgeridoos are culturally unique to the Northern Territory and that much more meaningful artefacts could be produced from local timbers using local knowledge. For example, gidgee and mulga are used locally to produce nulla nulla, boomerang, spears and digging sticks. If artefact production is based on local timbers and methods a Nandewar brand could be established and retail through the likes of a cultural heritage centre or the Red Chief museum.

This opportunity has potential to foster small to medium sized sales, utilise local labour and skills and provide a means for "handing on" local culture and practice. CDEP programs provide a useful foundation to develop this opportunity.

3.14 ABORIGINAL CULTURAL HERITAGE/ECOLOGY TOURISM

Both cultural heritage and ecology-based tourism were identified as relevant in the BBSB and both linked in well with the proposed Cultural Heritage Centre at Baradine. Once again both types of tourism are relevant in the Nandewar.

Cultural heritage tourism includes the provision of dance, music, language and medicine. Aboriginal people consulted in the Nandewar expressed an interest in providing cultural heritage tourism to visitors to the region. For instance, contact was made with Troy and Gwenda Allen of Mirii Yuligi (star dancers). Troy and Gwenda were in the process of moving their cultural education and dance based business out of Sydney and establishing it in Moree. Their experience in providing this form of tourism has led them to believe that there is a market for Indigenous tourism experiences in the northwest and that visitors are seeking a “bush and dust” based experience rather than an in-town “dance hall” style display.

Ecology based tourism would dovetail with Troy and Gwenda’s market research. Dance, music and language could be combined with the sharing of bush knowledge and the interpretation of sites. Naturally, caution is expressed in the accessing of sites and the risk of damage to sites as a result of tourism is noted. Guidelines would need to be prepared and agreed on who and when the sites were accessed.

The Red Chief LALC currently conducts cultural camps, sport, recreation and grazing on 6,000 ha in the southern part of the Nandewar. Peter Beale of Red Chief LALC takes groups to this area for cultural camps and suggests that partnerships could be established agencies such as Mission Australia.

Cultural heritage and ecology-based tourism would create synergies with proposals outlined in Chapter 2 to upgrade roads and maps. Peter Beale notes the potential for self-drive tours with relevant maps providing descriptions of historical events relevant to black-white relations. Tours could commence at the Gunnedah Red Chief Museum.

This group of opportunities may also benefit from training people in areas as diverse as hospitality, guiding, recognition/interpretation of natural and cultural heritage.

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) 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;
- 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; and

- The long-term effects of building interest in school groups for regional heritage tours are that they are likely to influence parents and carers to come to the region.
- This opportunity is recommended for further consideration in partnership with the BBSB Cultural Heritage Centre and the Red Chief Museum at Gunnedah.

3.15 ABORIGINAL STUDIES

A number of Aboriginal Elders in the Nandewar have expressed interested in teaching and passing on traditional stories. In addition, schools in the area– especially Moree and Tingha are attempting to develop programs based on Aboriginal cultural heritage. To realise this opportunity Elders will need more training to develop confidence with respect to presentation skills and suitable resource materials. Aboriginal people seem to be comfortable with program development in this area (pers. comm. Paul Craigie, Indigenous Officer, New England North West Consultative Committee).

Four types of study were suggested in the BBSB, they were:

- 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.
- 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.

These opportunities were workshopped in the Nandewar and the following comments were received:

- Documenting oral histories and incorporation of these histories into cultural activities could involve students, tourists and residents in an enriching experience. Students and tourists would learn Aboriginal dances, watch people making art, listen to stories, learn about language and be involved with role-plays.
- There is a need for assistance in the development of curricula and the conducting of activities to realise this opportunity.
- There is no site school in the Nandewar and this would assist with Aboriginal studies. A site school assists with identification, education and interpretation of Indigenous sites.

- A package could be prepared around arts and crafts, oral histories and incorporating these into cultural activities that could involve students, tourists and community residents.

An Aboriginal studies program in the Nandewar has potential to create synergies with BBSB opportunities (eg use of the proposed Cultural Heritage Centre) and link Aboriginal people in the Nandewar to tourism and education markets.

3.16 SITE ASSESSMENT CONSULTANCY AND/OR PUBLIC SECTOR EMPLOYMENT

Local Aboriginal people have undergone training in site recognition and have completed field surveys and reports for site assessments linked to mining exploration and the surveying of coupes for SFNSW. The opportunity to expand this activity is limited. It depends on a small number of investigations and the market for services would become oversupplied with the provision of additional trained entrants. Trained people were identified in the Nandewar as part of study consultation. No further advancement of this opportunity is suggested.

An obvious group of opportunities for the Nandewar Aboriginal community to arise from the Western Regional Assessment is public sector employment in forestry management. Aboriginal involvement in the management of public lands provides both an opportunity for Aboriginal people to have a say in management of country and employment potential. Employment and higher-level management potential with SFNSW and NPWS may include everything from ranger, heritage and education officer positions to positions for Aboriginal people trained in GIS and data management. The WRA process has 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 Aboriginal custodians who can provide access to and update this information will add value to future forestry planning decisions. Aboriginal people employed in these positions will need reading and writing skills. Aboriginal representatives have suggested cadetships and scholarships.

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

3.17 PRIORITY OPPORTUNITIES

Priorities for forest based development opportunities will be determined by the Nandewar Aboriginal community. Opportunities identified with representatives of the community during this study and a conclusion on their merit is summarised in the table below.

TABLE 3-B***Priority Opportunities for Nandewar Aboriginal Community***

Opportunity	Priority Ranking and Summary Comment
Supplementary cypress thinning	<ul style="list-style-type: none"> High priority, opportunity linked to BBSB initiatives.
Large scale investment in a mill	<ul style="list-style-type: none"> Low priority, industry does not favour new entrants at the current time.
Plantations/nurseries on Aboriginal owned land	<ul style="list-style-type: none"> Medium priority, subject to site specific investigations.
Green wood firewood industry	<ul style="list-style-type: none"> Medium priority, linked to BBSB and the need to weigh the use of thinnings for firewood against other productive uses.
Bush foods, bush medicines and seeds	<ul style="list-style-type: none"> High priority, small scale business based on locally distinct plants.
Apiary – commercial and native bee	<ul style="list-style-type: none"> Low priority, no interest expressed in commercial apiary or native bee apiary during consultation.
Indigenous cultural heritage centre	<ul style="list-style-type: none"> High priority, showcase for local artefacts, teaching and a place to foster pride. BBSB Cultural Heritage Centre would receive support.
Art and craft production and retailing	<ul style="list-style-type: none"> High priority, brand to be developed based on locally distinct products and knowledge.
Cultural heritage/ecology tourism	<ul style="list-style-type: none"> High priority, to be developed in partnership with the BBSB Cultural Heritage Centre proposal and/or the Red Chief museum.
Aboriginal studies	<ul style="list-style-type: none"> High priority, offers synergies with BBSB Cultural Heritage Centre and links Aboriginal people to tourism and education markets.
Site assessment consultancy	<ul style="list-style-type: none"> Low priority, small market with well established existing players.
Public sector employment	<ul style="list-style-type: none"> High priority, opportunities for training and custodianship of WRA data.

High priority opportunities include supplementary cypress thinning, LALC participation in conservation incentive programs, public sector employment and a group of opportunities that includes cultural heritage tourism, arts and crafts production and retailing, bushfoods and Aboriginal studies.

4

Mineral, Construction Material and Petroleum Opportunity Assessment

4.1 INTRODUCTION

At the request of RACD the study was expanded to incorporate minerals, construction material and petroleum opportunities identified by the NSW Department of Mineral Resources (DMR). This chapter deals with the significance of mineral, construction material and petroleum in the Nandewar Bioregion and presents information on identified resources, relative importance, opportunity assessment and an overall conclusion.

The identified opportunities were assessed under a range of criteria as used in earlier chapters, including: resource availability and sustainability; availability of markets; employment created; capacity to attract investors; appropriate support infrastructure; scale of impacts created by the opportunity; skills available; community/government support; government assistance required; and capacity to create opportunities for the Aboriginal community.

4.2 RESOURCES IDENTIFIED

The Nandewar is considered to have a diverse range of minerals and construction materials available for mining, varying significantly in their level of prospectivity. Mineral resources identified within the Nandewar Bioregion include coal, magnesium, limestone, diatomite, kaolin, various construction materials, olivine, sand, sapphire, zeolite, diamond, magnetite, and various base and precious metals. The weighted mineral potential data indicates that the areas of highest potential are scattered (McEvelly et al. 2003). These are shown in the table below.

TABLE 4-A***High potential areas for minerals and construction materials***

Area	Deposit
Ashford, Werris Creek and Murrurundi	Coal
Nandewar Range	Petroleum and coal seam methane
Barraba	Diatomite, magnesium and gold
Attunga	Base and precious metals and limestone
Werris Creek	Zeolite, gold and silver
Bingara	Gold and diamond
Inverell	Diamond, tin, kaolin and sapphire
Major Roads – adjacent	Construction materials

Source: McEvilly et al. (2003)

A very large magnesium deposit occurs in mine tailings at Barraba (\$20 billion resource), at the old Woodsreef Asbestos Mine (Roger McEvilly, DMR). An initial estimation of the project is \$680 million in capital costs and full time employment of around 350 people. However it is unclear whether this project is viable, as projected future prices and demand for magnesium are uncertain.

Concern was raised during the review of this report that there may be possible tailings contamination problems associated with the mining operations planned for Barraba magnesium deposit. The DMR reports that a pre-feasibility study indicated that with appropriate measures, the resource could be mined safely.

The Bickham Coal project (on the border between the Hunter and Nandewar regions) is a large coal project (approximately a \$2 billion resource) situated in the extreme southwest near Murrurundi. Resources of coal are also under assessment near Werris Creek (approximately a \$500 million resource) and Ashford (approximately a \$1.6 billion resource). (Roger McEvilly, DMR).

In recent decades, three coal developments have been approved in the Boggabri/Maules Creek area within the Brigalow: Vickery, Maules Creek, and Boggabri. Vickery open cut operated between 1985 and 1998 and produced some 4 million tonnes for the domestic and export thermal markets. Development consents were granted for the Boggabri and Maules Creek projects for a total production capacity exceeding 10 million tonnes/annum. However, the projects could not proceed to the production stage for various reasons, the most significant of which were the limited capacity of the existing north western railway line, the distance to the port of Newcastle, and timing of development with respect to coal prices. To be able to handle the production for the Boggabri and Maules Creek projects, the existing northwest railway line would need a significant upgrade and the construction of a tunnel through the Liverpool Range.

In more recent years Whitehaven open cut mine has been producing coal at around 0.7 Mt /annum for export. The Belmont Proposal is at the Development Application stage. When approved it is planned to produce about 1Mt per annum, also for export.

Recent annual production figures of minerals and construction materials are outlined in Table 4-B below.

TABLE 4-B
***Recent Annual Production Figures, Nandewar
Bioregion***

Commodity	Production
Limestone/Agricultural Lime	\$8,280,103
Sapphire	\$1,893,439
Diatomite	\$2,893,253
Zeolite	\$464,008
Diamond	~\$50,000
Serpentinite	\$10,200
Gold	\$1,600
Rhodonite	\$7,240
Unprocessed construction materials	\$774,189
Crushed and broken stone	\$1,005,409
Construction sand	\$347,990
River gravel	\$49,352
Loam	\$1,060
TOTAL PRODUCTION (approx)	\$15,777,843

Source: DMR – Summary provided for RACD (2004)

Gemstone fossicking, and associated tourism opportunities are important in the Inverell and Bingara areas.

The coal resources in the southern part of the Nandewar and in most cases in the Brigalow are not yet competitive with those of the Hunter primarily due to additional transport costs to the port of Newcastle. However, discussions with the DMR revealed that they expect production in the Hunter Region to start to decline in 10-20 years time as the Hunter open cut mines lose this cost advantage due to a necessary change to underground mining. Any decline from the Hunter is expected to be met by the Gunnedah Coalfield (in the Brigalow), with some production also likely from the Nandewar.

4.3 TRANSPORTATION

A major impediment to the mining of the coal resources in the Nandewar is the costs of transport. In the case of the Nandewar there are two main ports that either currently, or would in the future, service the industry. These are at Newcastle, to the South East, and Brisbane to the North East.

It is possible that a tunnel through the Liverpool range might be able to link in the mineral resources of the Brigalow through to Newcastle, also able to be linked in for the Nandewar. Regardless of the tunnel, or simply an upgrade (and expansion) of the current lines, the existence of Coal Seam Methane provides additional support to the building of a more effect transport route as costs could be shared, effectively reducing the cost to all parties concerned.

Overall, and in context, any likely financial costs of upgrading the transport link from the Brigalow and Nandewar are minor compared to the total value of resources that this link would access. The Leard State forest alone is estimated to have resources worth around \$100 billion in coal. A closer economic study into this link, beyond the scope of this report, would need to be carried out to establish its economic merit.

To the far north of the Nandewar, coal at Ashford is currently being investigated, with proved resources around 22 Mt and a current market value of approximately \$1.6 billion (Roger McEvilly, DMR). Preliminary investigations suggest the coal resources in this area could also be much larger, and the proved resources are good quality, high value coking coal suitable for the export market. Were the Ashford mine to go ahead, it is likely that instead of it being transported to Newcastle, it would be transported to Queensland ports for bulk haulage to market. Ashford is located about 350 kilometres from Brisbane.

4.4 RELATIVE IMPORTANCE

Exploration expenditure for various minerals and construction materials in the Nandewar Bioregion has averaged around \$2 million per annum over the last decade. In addition to exploration expenditure mineral sales have averaged \$15.7 million with royalties of \$0.6 million. The industry's importance, relative to other sectors that utilise the bioregions forested lands, is shown in the table below.

TABLE 4-C***Relative Contribution of Major Forest Based Industries***

Industry	Gross Value of Annual Production on Public & Private Lands (\$)	Employment Created (Full Time Equivalent Positions)
Minerals	\$16 million ^a	90
Forest based tourism and recreation	\$3 million ^b	Not available
Timber milling	\$9 million	193

SOURCE: Roger McEvilly, DMR.

a) Estimated to be approximately 90% private land

b) Public land only, based on an estimated 2% of visitation to the region visiting a forest or national park.

While mineral production in the Nandewar is relatively modest compared to other NSW regions its relative importance is high.

4.5 OPPORTUNITY ASSESSMENT

Assessment of minerals, construction materials and petroleum opportunities in the Nandewar is presented in Table 4-D.

TABLE 4-D***Opportunities Assessment for Minerals, Construction Materials and Petroleum***

Resource availability and sustainability	<ul style="list-style-type: none"> Region is important for a wide range of mineral resources. Most prospective mineral resources are coal and magnesium. There is currently exploration in the region for petroleum (including coal seam methane), coal, gold, silver, sapphire, tin, limestone, diatomite, various base metals, diamond and zeolite.
Markets	<ul style="list-style-type: none"> World markets are available for minerals and local markets are available for construction materials. Distance to markets is potentially an issue for coal relative to other deposits. Oversupplied world magnesium markets could be an issue.
Employment created	<ul style="list-style-type: none"> Substantial during both exploration and operation. Employment is currently the equivalent of 90 FTE but has been as high as 140 FTE in the last 10 years.
Capacity to attract investors	<ul style="list-style-type: none"> Commercial opportunity.
Scale of impact	<ul style="list-style-type: none"> Small to large, depending on commodity.

Skills available	<ul style="list-style-type: none"> • Yes.
Appropriate support infrastructure	<ul style="list-style-type: none"> • Infrastructure is adequate.
Community/Government support	<ul style="list-style-type: none"> • Support linked to employment and appropriate environmental safeguards is likely.
Government assistance required	<ul style="list-style-type: none"> • Nil in addition to appropriate land tenure. • Crown land or SFNSW tenure preferred to alternatives.

Minerals exploration and production are an important economic opportunity in the Nandewar.

5

Description and Evaluation of Conservation Opportunities

5.1 INTRODUCTION

The purpose of this chapter is to provide information on incentives and obstacles for conservation on both public and private land in the Nandewar Bioregion and to identify potential mechanisms for encouraging and enhancing conservation management. This chapter includes:

- An introduction to incentives for biodiversity and native vegetation conservation, including a summary of existing incentive schemes in NSW and relevant examples from the domestic and international literature;
- An outline of potential commercial opportunities for conservation of native vegetation;
- Identification of conservation efforts made by landholders within the Nandewar Bioregion and obstacles to further conservation management;
- Evaluation of potential incentive mechanisms and their relevance to the Nandewar Bioregion; and
- A summary of conservation opportunities in the Nandewar Bioregion and recommendations for the use of incentive mechanisms.

A number of sources were used to gather information for this chapter. These included:

- Outputs from linked consultancy NAND11;
- Australian and overseas literature relating to native vegetation and biodiversity conservation and the use of incentive mechanisms;
- Consultation with agency people, scheme managers/coordinators and scheme participants; and
- Three landholder focus groups, which were designed to provide a representative coverage of landholders across the bioregion.

At the request of RACD, two planned community workshops were cancelled. Workshop timing coincided with a pending decision on the BBSB. Nandewar and BBSB are intertwined and formal workshops were not appropriate at this time.

In recent years there has been increasing interest amongst agricultural and environmental professionals surrounding conservation of native vegetation and biodiversity on public and private land, which has resulted in the emergence of a wealth of literature on the issue. The available literature ranges from theoretic consideration of the underlying social and economic principles of conservation to reporting on pilot programs and policy initiatives. As part of this study a range of both domestic and international literature was reviewed and considered in the identification and assessment of conservation opportunities for the Nandewar. It is not the purpose of this report however, to present an in-depth review of this literature. Rather, insights from the literature have been considered along with consultation insights to provide an assessment of opportunities in the context of the Nandewar Bioregion¹¹.

5.2 CONSERVATION INCENTIVE MECHANISMS

Introduction

In the past, the provision of native vegetation and biodiversity conservation for the public good has been through national parks and public reserves (PC 2003). However, with less than 1% of land in the Nandewar Bioregion under public control for conservation purposes, conservation objectives are unlikely to be achieved without commitments from private landholders.

There are a number of policy options that can be used to promote and achieve conservation objectives. Binning and Young (2000) classified these options into three broad categories:

- Education and motivation (People);
- Property rights instruments (Security); and
- Incentive instruments (Finance).

Education and motivation tools can be used to motivate and retain landholder support for conservation management. They facilitate the understanding and willingness required by landholders and communities to adopt new management practices for the conservation of native vegetation and biodiversity.

Education and motivation tools that may be adopted include:

- Landholder extension including community extension and individual extension;
- Education including decision makers and community leaders, landholders, schools, community and voluntary involvement; and
- Local environmental awards and community recognition.

¹¹ Publications by Binning and Young (2000), Chaudri *et al.* (2000) and the Productivity Commission (2003) provide a more extensive discussion of the theory underlying policy options and incentive mechanisms for biodiversity conservation.

Property rights instruments are used to provide secure adaptive management of native vegetation and biodiversity. Property rights are defined through policies and legal institutions and describe the entitlements and obligations relating to a parcel of land, such as grazing rights or clearing restrictions. Property rights mechanisms are not always regulatory and may be entered into voluntarily.

Property rights mechanisms include:

- Regulation;
- Voluntary management agreements; and
- Covenants.

Incentive instruments can be used to share the cost of conservation between landholders and the wider community. In most cases financial incentives are critical for securing the voluntary uptake of conservation programs because of the “public good” characteristics of many conservation objectives.

Types of financial incentive mechanisms that can be used are many and varied and may include direct monetary payments and indirect financial incentives. Examples include:

- Community grants and cost sharing arrangements;
- Stewardship payments;
- Transition incentives;
- Tax incentives including property rates and taxes, and incentives related to property donations;
- Environmental markets including revolving funds and tradeable permits;
- Tradable development rights;
- Acquisition/reservation by various public agencies;
- Offset requirements (tax on clearing); and
- Developer contributions (tax on development).

Sources of funds for financial incentive instruments include environmental levies on the community, consolidated revenue at different levels of Government and the private sector.

Binning and Young (2000) concluded that policies harnessing synergies between the three approaches are likely to be more effective in terms of cost and environmental outcomes.

Existing Incentive Schemes in NSW

Policies aimed at promoting biodiversity and native vegetation conservation in Australia and NSW have tended to rely on a mixture of elements from the options outlined above, i.e. education and motivation, property rights and financial incentives. For example, conservation covenants such as the Voluntary Conservation Agreements program administered by NPWS is essentially a property rights tool that offers financial incentives such as the provision of fencing materials to encourage participation.

Statewide regulatory instruments in NSW relating to the management and conservation of native vegetation and biodiversity have included the:

- National Parks and Wildlife Act 1994 (NPW Act);
- Native Vegetation Conservation Act 1997 (NVC Act);
- Environmental Planning and Assessment Act 1979 (EP&A Act); and
- Threatened Species Conservation Act 1995 (TSPC Act).

These pieces of legislation contain approval processes that landholders must follow to ascertain whether clearing of native vegetation is permissible or not.

This regulatory approach to conservation management in NSW is currently under reform and a new structure based around Catchment Management Authorities (CMAs) and a Natural Resources Advisory Council (NRAC) expected to emerge. Principles articulated here are expected to remain valid.

One of the major limitations of straight regulatory approaches is that they are not proactive. Therefore, while mechanisms such as the approval process under the NVC Act may serve to limit land clearing it does not actively encourage landowners to manage these remnants or areas of their property that may already be cleared in a manner that enhances their conservation value. Consequently other incentive mechanisms may be necessary.

Incentive schemes operating within the NSW regulatory framework can be grouped into the following five mechanism types:

- Land purchase – land may be purchased to add to the public reserve system and managed by the state government. Alternatively covenants can be placed on land and sold to interested parties. Properties may also be purchased and managed directly by non-government conservation organisations.
- Non-binding management agreements – voluntary agreements made with participants committed to conservation. These agreements can be amended or ceased by either party at either time.
- Covenants – permanent, legally binding restrictions on land use. Participation in these agreements is voluntary.

- Grants and subsidies – there are a number of grants and subsidies available for on-ground actions on public and private land administered through conservation groups such as Landcare, Greening Australia and WWF Australia.
- Competitive bidding mechanisms – landholders prepare bids based on the payment they would be willing to accept for the provision of environmental services. Scheme administrators assess the bids based on the benefits they provide (usually by use of an environmental or biodiversity benefits index) and select the least cost alternatives.

Table 5-A provides examples of the main incentive schemes that have been available to landholders in NSW under each of the five mechanism types listed above. Many of these examples are either directly applicable to other states within Australia, either through the Federal Government or national organisations, or are similar to state programs offered by the relevant agricultural and natural resource agencies across Australia. Significant progress has been made in Victoria through the Bush Tender Scheme being trialled and developed by DNRE. Tender and auction schemes make use of environmental and/or biodiversity benefits indexes similar to that used in the United States Conservation Reserve Program. Case studies of the Victorian Bush Tender Scheme and the United State Conservation Reserve Program are presented in Appendix 1.

An evaluation of incentive mechanisms in terms of their relevance and appropriateness for implementation in the Nandewar Bioregion is provided in section 5.4.

TABLE 5-A

Existing Incentive Schemes in NSW

Land Purchase	
<i>Scheme</i>	<i>Description</i>
Nature Conservation Trust	<ul style="list-style-type: none"> • Non-government corporate scheme formed by partnership with NSW government, World Wildlife Fund For Nature, NSW Farmers Association, Greening Australia and the NSW Aboriginal Land Council. • The Trust operates as a revolving fund where land is purchased, placed under a Conservation Trust Agreement and sold to private owners with interests to conserve the area. • Conservation Trust Agreements operate in perpetuity hence provide for the permanent protection of purchased land. • NHT and the NSW government provided initial funding for the Trust. Future funding is to be sourced privately from the community and industry with associated tax incentives.

Non-Binding Management Agreements	
<i>Scheme</i>	<i>Description</i>
Property Agreements Scheme	<ul style="list-style-type: none"> • Administered by DLWC (now DIPNR). • Combines vegetation management agreements and direct monetary payments through Management Contracts and Property Agreements under the NVC Act. • Agreements are voluntary and may be entered into by individual or groups of landholders with the Director-General of DLWC. Contracts are for 5-10 years and can be terminated at any time with the consent of both parties. • Financial assistance is available through the Native Vegetation Management Fund for works including fencing, weed control and revegetation or re-establishment of native vegetation.
Wildlife Refuges	<ul style="list-style-type: none"> • Managed by NPWS. • Refuges protect all or part of a property through implementation of an agreed management plan. Areas are declared under the NPW Act. • Agreements are voluntary and can be entered into by private landholders, public land managers and lessees of Crown land. The agreement is flexible and can be revoked or varied at any time by either party. • There is generally no financial incentive provided however, participants have access to advice and assistance from NPWS staff.
Land for Wildlife	<ul style="list-style-type: none"> • Community-based scheme coordinated by NPWS. • Landholders show their interest in managing areas for wildlife on their property alongside their other land management objectives by registering their property with the scheme. • Voluntary support scheme, which is not legally binding. Registration ceases on sale of property. • No financial assistance provided. Landholders are provided with information about wildlife management and access to a network of land managers with like objectives.
Covenants	
<i>Scheme</i>	<i>Description</i>
Voluntary Conservation Agreements	<ul style="list-style-type: none"> • Managed by NPWS. • Covenants provide for permanent protection of all or part of a property. The agreement runs with the title of the land and may restrict or prohibit certain activities over the area. • Agreements are voluntary and may be entered into by private landholders, public land managers and lessees of Crown land with the Minister for the Environment. The agreement can only be revoked by the Minister. • There is little financial incentive however NPWS may provide assistance in the form of fencing materials, plant and animal surveys, weed control and species advice. Landholders may be eligible for rate relief and tax deductions however this is not controlled by the NPWS.

Grants and Subsidies	
<i>Scheme</i>	<i>Description</i>
Landcare (including Bushcare, Rivercare etc)	<ul style="list-style-type: none"> • An independent network of people around Australia who form groups at the local level. There are more than 1,700 Landcare groups across NSW. DIPNR is the lead government agency supporting Landcare. • Groups at locally to raise community awareness and perform on ground works to repair and prevent land and water degradation. • Participation is voluntary and encompasses the entire community. On ground action occurs on both public and private land • Most Landcare funding for on ground action has been through Envirofund and NHT.
Competitive Bidding Mechanisms	
<i>Scheme</i>	<i>Description</i>
Environmental Services Scheme	<ul style="list-style-type: none"> • Managed by an Environmental Services Investment Team comprised of reps from DIPNR, SFNSW and NSW Agriculture. • Landholders receive income for providing environmental services through creation of markets for these services. • 25 properties have initially been selected to trial the identification and delivery of a range of environmental services. Landholders in priority salinity or coastal sulfate soil areas with their primary income sourced from farming were eligible. Eligible applicants were shortlisted and required to prepare a bid providing details of the amount they would accept as an annual payment for the environmental services they wished to provide. • Selected properties receive an annual payment for the services they provide. The payment will continue for the duration of the contract, which is likely to be for 3-5 years. An initial investment of \$2 million has been made available from the Environmental Services Investment Fund.
Liverpool Plains Land Management Tenders	<ul style="list-style-type: none"> • Managed by the Liverpool Plains Land Management Committee (LPLMC) in collaboration with WWF – Australia. • Landholders receive income for the provision of environmental services. Services include biodiversity, salinity and water quality benefits. • Scheme operates as a tender system with proposals assessed using an environmental benefits index. Participants enter into management agreements with the LPLMC. • Selected properties receive financial incentive through an annual payment for the services they provide. Funding is sourced from WWF, State and Federal Government.

Setting Financial Incentive Levels

One of the key issues associated with incentive instruments relates to the magnitude of the financial incentive required to influence landholders to retain and manage native vegetation.

In principle, landholders would have to be equal to or better off after any change for them to voluntarily enter into agreements to increase conservation management on their property.

BDA Group and Gillespie Economics (2001) identified that the required incentive payment to encourage landholders to voluntarily retain and manage native vegetation would relate to:

Opportunity costs + direct costs – private benefits.

Opportunity cost relates to the potential net profit that could be achieved from the land if it were not used for vegetation conservation. For instance, Middleton, Lockyer, Dean and Sinden (1998) identify the opportunity cost of conserving native vegetation as the projected discounted flow of annual net (agricultural) profit that could be achieved from the land minus the costs of clearing and development. An alternative measure of opportunity cost is the likely change in land value if clearing is prohibited.

Direct costs include up-front and ongoing time and money expended on the actions required to manage retained areas. For the conservation of remnant vegetation and its associated biodiversity, required management actions may include vegetation retention, fencing, weed control and pest control.

While the direct costs plus opportunity costs provide a starting point for consideration of incentives to landholders for retaining and managing native vegetation, landholders may actually be willing to accept less than this amount and still provide the public conservation service. The reason for this is that the retention and management of native vegetation may also have *on-farm private use and non-use benefits to the landholder*. For instance private use benefits from the retention and conservation of native vegetation may include:

- Benefits for adjoining crops and/or pasture growth;
- Benefits for livestock production;
- Timber for firewood, fencing and brushwood;
- Forestry;
- Honey production;
- Seed collection;
- Aesthetics for the property;
- Habitat for animals that help control pests;
- Tourism and recreation opportunities;
- Wildflowers and native plants; and
- Other minor uses.

Landholders may also value native vegetation for its non-use values. Non-use values may include option values and bequest values. Option values relate to the benefit of maintaining the right to use resources without necessarily doing so. It may include future use by existing individuals or by future generations. Bequest values refer to the maintenance of environmental attributes for the benefit of future generations (BDA Group and Gillespie Economics 2001).

On the basis of the above discussion, three broad groups of landholders can be identified:

- Landholders where no financial incentive is required to encourage the voluntary retention and management of native vegetation - for some landholders there would be no opportunity costs associated with retaining vegetation and the private benefits to the landholders from retention and conservation would be greater than any direct costs of management. These landholders are likely to be already conserving and managing native vegetation and may be willing to enter into voluntary conservation agreements with little or no additional financial incentives. Similarly, educating landholders about the potential private benefits of native vegetation retention and management may help to expand the numbers of landholders that fall within this group.
- Landholders where a modest financial incentive relating to direct management costs is required to encourage the voluntary retention and management of native vegetation - for some landholders there would be no opportunity costs associated with retaining vegetation. However, the direct costs of actively managing retained vegetation may outweigh any private benefits to the landholders from retention and conservation. These landholders may be willing to enter into management agreements provided that they receive some financial incentive related to the costs of active vegetation management. Educating landholders about the potential private benefits of native vegetation retention and management may help to reduce the payment that they require to enter into an agreement.
- Landholders where a more substantial financial incentive relating to opportunity costs and direct management costs is required to encourage the voluntary retention and management of native vegetation - for some landholders there would be an opportunity costs associated with retaining existing vegetation. These opportunity costs together with direct costs of management may outweigh any private benefits to the landholders from retention and conservation. These landholders may be willing to enter into management agreements provided that they receive some financial incentive related to the opportunity costs vegetation retention as well as the direct costs of active vegetation management (less the value of private benefits). Educating landholders about the potential private benefits of native vegetation retention and management may help to reduce the payment that they require to enter into an agreement.

A key finding is that different landholders will require different magnitudes of financial incentive in order to encourage them to voluntarily retain and actively manage native vegetation.

In practice there are a number of approaches that can be used to determine price, including:

- Fixed price schedule - involves a schedule of prices per ha or per metre of fencing etc.
- Bilateral negotiation – involves the direct negotiation between the seller and one or more buyers.
- Competitive tender – involves a discrete sales process where the buyer retains significant flexibility in how the successful seller will be chosen and can allow negotiation on final terms with that bidder.
- Auction format – involves a more structured sales process of a clearly defined commodity with clear rules on how prices will be struck and bidders chosen to complete the sale (BDA Group and Gillespie Economics 2001).

In NSW, the price of incentives is generally determined through either a scheduled approach or bilateral negotiation.

With a scheduled approach, participation in the conservation program is a function of the unit prices that are identified. Those landholders for whom the price is less than that required to offset opportunity costs plus direct costs of management less private benefits, will not participate in the program. Hence the scheduled prices may drastically affect participation rates and hence the total cost of the program. Those landholders for whom the price is greater than required to offset opportunity costs plus direct costs of management less private benefits, will actually make a profit. That is, these landholders are being paid more than their minimum willingness to accept payment. Consequently, the maximum conservation outcome for the budget is not being achieved.

Bilateral negotiation is an improvement on scheduled payments since it allows the unique circumstances of individual sellers to be considered and factored into price or non-price aspects of contracts. However the negotiations are only informed by the price information that the participants bring to the negotiations, rather than the collective valuations of all potential sellers.

Consequently tender or auction approaches are more useful when the goods do not have a fixed or determined market value. Auctions in particular can be used to maximise ‘price discovery’ by providing an explicit mechanism that identifies market depth and describes how prices are formed. They can also be less costly and time consuming than a series of individual negotiations.

5.3 POTENTIAL FOR COMMERCIAL OPPORTUNITIES FOR PROFITABLE CONSERVATION

Environmental Services

As well as potentially being eligible for direct or indirect financial payments, conserving native vegetation may provide a range of environmental services, which may provide opportunities for a further commercial return as markets develop.

Potential environmental services provided by native vegetation conservation include reduction in greenhouse gas and contribution to salinity management. There are currently no markets for these types of environmental services in the Nandewar Bioregion. Potential for these markets is however being explored in pilot programs such as the Environmental Services Scheme and the Liverpool Plains Land Management Tenders, which do involve a limited number of participants located within the Nandewar.

Commercial Opportunities for Remnant Vegetation

As well as the environmental services, identified above, that are associated with native vegetation conservation, native vegetation conservation may also be associated with a range of potential commercial economic opportunities for the landholder. Identification of these potential commercial opportunities may encourage landholders to consider remnants as a valuable farm resource.

Potential commercial opportunities were detailed in Chapter 2 of this report. While none of these opportunities generate a “stand alone” commercial return, they do have potential to contribute to annual farm financial performance.

There is also some potential for conservation by the private sector rather than by the landholders themselves. Two private conservation companies in Australia—Earth Sanctuaries Pty Ltd (ESL) and the Australian Bush Heritage Fund—obtain the bulk of their income from individual and corporate donations (Bennett 2002).

5.4 CONSERVATION IN THE NANDEWAR BIOREGION

Introduction

In this section conservation efforts made by landholders within the Nandewar Bioregion in recent history are identified along with obstacles restricting further conservation management. Available resources within the bioregion are considered and future conservation opportunities identified. Together this information is used to evaluate the appropriateness of potential and existing incentive mechanisms as identified in section 5.2.

This section draws on outputs from NAND11 and information gathered from three landholder focus group sessions held in the bioregion in February 2004. Focus groups were held in Inverell, Bingara and Manilla to achieve coverage across the bioregion and to incorporate landholders from the different farming systems. At RACD's request, focus groups were restricted to approximately five participants each.

Private Landholder Efforts Toward Conservation

In a meeting of the Nandewar Socio-Economic Project Coordination meeting on 28 August 2003, Hassall & Associates undertook to gather information on biodiversity and conservation outcomes that have been achieved privately through changes in farming practices in the region in recent history. The information gathered is presented in the section.

Findings from agricultural profiling work for NAND11 indicated that there is little data available on conservation of biodiversity and native vegetation on private land within the Nandewar Bioregion. The information in this section is therefore largely anecdotal.

The 2001 ABS Agricultural Census collected data for a number of land management indicators including information about on-farm conservation initiatives. The data is limited in the sense that figures only represent additional areas that were fenced or planted with species in the 2000/01 year and therefore do not represent the total area conserved for remnant vegetation or planted trees and shrubs on agricultural land in the Nandewar. The data indicates that less than 1% of total farms in the seven main LGAs within the Nandewar Bioregion undertook actions to fence off areas of remnant vegetation and to plant and fence trees and shrubs for nature conservation.

Landholders consulted as part of this study were keen to express that increasing tree cover is not the answer to many of their natural resource issues and that in many cases permanent grasses are more effective in promoting groundcover, preventing salinity, erosion, and improving soil health.

As identified in NAND11 and ratified during consultation in this project, most on-farm conservation efforts in the Nandewar Bioregion have been directed at changing farming management practices as compared to the protection of remnant vegetation.

On-farm conservation efforts have included:

- Minimum till cultivation;
- Introduction of rotations into cropping systems;
- Rotational and holistic grazing;
- More effective pest and weed control;
- Better management of riparian zones; and
- More active participation in Landcare groups and conservation networks.

Obstacles to Conservation Expansion

Consultation with landholders and agency representatives completed as part of this project indicated that there are a number of obstacles to the expansion of native vegetation and biodiversity conservation on both public and private land. Those obstacles identified included:

- The area of land under public control for conservation outcomes in the Nandewar is small representing less than 1% of the bioregion.
- There are generally lower levels of profitability from retaining or planting native vegetation than there are from traditional productive uses, i.e. there is a net opportunity cost of setting aside land for conservation;
- There is a perception of a lack of government resources devoted to conservation management on public land in terms of fire management, weed and pest control;
- Both public and private landowners may be unaware of available incentive schemes;
- Financial incentives offered through schemes are insufficient to attract landholder interest;
- Red tape and tedious application processes discourage participation in schemes;
- There is a general distrust in government amongst private landholders hence they are unwilling to be involved in government administered schemes and are reluctant to let government officials onto their properties.

Identification of Available Resources and Conservation Opportunities

In the points below, land resources in the Nandewar Bioregion are considered in terms of their conservation potential:

- Five representative farm types for the Nandewar Bioregion were identified in NAND11. These were: grazing; specialist cropping; mixed farming and grazing; productive grazing; and heavily timbered limited grazing systems. Indicative gross margins identified for each of these systems would suggest that the opportunity costs of foregone agricultural production are lowest for grazing and heavily timbered/limited grazing systems. These farming systems are common right across the bioregion.

- Consultation with landholders suggested that there were likely to be areas of remnant vegetation on most private properties in the bioregion. These areas tended to be of marginal production value and would likely be retained without the need for further incentive.
- Landholders in the Bingara and Inverell regions also indicated that some country was being taken out of cropping as cultivation proved unsustainable and unprofitable. This is consistent with findings in NAND11 that indicated a decline in cropped areas in these regions. This trend may increase the areas available for conservation of native vegetation and associated biodiversity.
- Specialist cropping systems will not only have the highest opportunity cost if set aside for conservation, they will also require additional costs to re-establish native trees, plants and shrubs.
- Less than 1% of the Nandewar Bioregion is under public control for conservation purposes. The Nandewar Regional Overview (DEC, December 2003) however, states that “certain strategic areas of public land [i.e. State Forests] could contribute ... to a larger and more diverse reserve system in the Nandewar”. However, consultation has revealed that there are diverging views amongst stakeholders as to whether a change in tenure from Crown Land to National Park is suitable for the Nandewar.
- Travelling Stock Routes may prove to be a valuable public resource for conservation purposes. These areas tend to already be well established in terms of their native vegetation cover and could form important linking areas for biodiversity and habitat.

Evaluation of Potential Schemes for the Nandewar Bioregion

A number of potential incentive mechanisms have been identified for the Nandewar Bioregion. These mechanisms can be classified into the following categories: land purchase; voluntary agreements; covenants; grants and subsidies; and competitive bidding mechanisms.

While education and the provision of information are recognised as vital means for increasing knowledge and understanding of conservation management and encouraging participation in programs, education and information is not evaluated explicitly in this section. It is considered that information packages and educational programs should accompany any incentive mechanism that is implemented and should be targeted at both landholders and the wider community.

The appropriateness of each of the mechanism types to the Nandewar Bioregion was assessed using the criteria listed below. Criteria are based on findings from the review of literature relating to conservation management and the needs identified by landholders and community representatives in the consultation process.

- Targetability – ability to target priority areas for achieving conservation objectives.
- Ongoing management – does the mechanism provide for the ongoing control of weeds, feral animals and fire management?
- Cost effectiveness – ability to achieve conservation objectives at minimum cost.

- Transparency – can the outcomes of the scheme be identified and measured?
- Monitoring and Evaluation – can the scheme be easily monitored and evaluated in terms of both administration and participation?
- Landholder acceptability – what is landholder feeling towards the scheme? Consultation with landholders suggested that flexibility, simplicity of the process and financial incentives contributed favourably to landholder acceptability.
- Community/Government support – acceptability by government and the wider community.

A key criteria analysis of each mechanism type is provided below. The analysis incorporates insights from consultation with landholders, scheme participants and coordinators.

Land Purchase

Land purchase has the ability to add to and be managed alongside the public reserve system. Alternatively covenants can be placed on the land and the land resold to parties committed to conservation management. An assessment of land purchase schemes is presented in Table 5-B.

TABLE 5-B
Opportunity Assessment of Land Purchase Schemes

Targetability	<ul style="list-style-type: none"> • Owners of priority sites can be approached however acceptance is not guaranteed.
Ongoing management	<ul style="list-style-type: none"> • Ongoing management of land for feral pests, weeds and fire management is an issue. • Reselling land to “conservation minded” individuals can reduce costs of ongoing management.
Cost Effectiveness	<ul style="list-style-type: none"> • Land available for purchase is often run down and therefore potentially of low conservation value. • Securing priority sites is likely to be expensive.
Transparency	<ul style="list-style-type: none"> • Good.
Monitoring and Evaluation	<ul style="list-style-type: none"> • Easily monitored and evaluated however this is costly.
Landholder acceptability	<ul style="list-style-type: none"> • Approach is well accepted if voluntary however the level of participation will depend on the payment provided.
Community/Government support	<ul style="list-style-type: none"> • Potential to add to the reserve system is attractive. • Management of purchased land must be considered. • Likely to be the most expensive option from government perspective.

The primary concern expressed by landholders of purchasing land to add to the reserve system was with ongoing management of the sites. Landholders commented that they believe existing areas of national parks to already be poorly managed in terms of weeds, vermin control and fire prevention. It was also felt that unless considerable funds were expended, land purchased in this way would likely be run down and as a result have potentially low conservation value requiring further funds for revegetation and regeneration of the site.

Non-Binding Management Agreements

Landholders interested in conserving biodiversity and native vegetation on their properties can enter into voluntary non-binding management agreements. A criteria assessment of non-binding management agreement schemes is presented in Table 5-C.

TABLE 5-C

Opportunity Assessment for Voluntary Agreements

Targetability	<ul style="list-style-type: none"> • Voluntary nature limits targetability. • Landholders in priority areas can be approached. However this increases administration costs and participation is not guaranteed.
Ongoing management	<ul style="list-style-type: none"> • There is little incentive for ongoing management.
Cost Effectiveness	<ul style="list-style-type: none"> • Reliance on “conservation minded” participants reduces budgetary costs. • Limited targetability does not guarantee greatest conservation outcome for dollar expended.
Transparency	<ul style="list-style-type: none"> • Good.
Monitoring and Evaluation	<ul style="list-style-type: none"> • Easily monitored and evaluated. However this is costly.
Landholder acceptability	<ul style="list-style-type: none"> • Agreements are flexible and allow conservation to be achieved along with other land management objectives. • Process is relatively simple. • Little financial incentive.
Community/Government support	<ul style="list-style-type: none"> • Voluntary and relatively inexpensive therefore well supported.

Consultation indicated that voluntary rather than prescriptive approaches were likely to be viewed most favourably by landholders. The flexibility associated with non-binding agreements was also attractive to landholders. However, they felt that the assistance provided by these schemes provided little incentive for ongoing management of the areas hence actual conservation benefits might not be achieved. Landholders felt that schemes should be aimed at changing land management practices rather than “locking up” country.

Covenants

Landholders who wish to permanently protect native vegetation and biodiversity on their properties can enter into covenants to place legally binding restrictions on land use. An assessment of covenants is presented in Table 5-D.

TABLE 5-D
***Opportunity Assessment for Analysis of
Covenants***

Targetability	<ul style="list-style-type: none">• Voluntary nature limits targetability.• Landholders in priority areas can be approached however this increases administration costs and participation is not guaranteed.
Ongoing management	<ul style="list-style-type: none">• There is little incentive for ongoing management.
Cost Effectiveness	<ul style="list-style-type: none">• Reliance on “conservation minded” participants reduces budgetary costs.• Limited targetability does not guarantee greatest conservation outcome for dollar expended.
Transparency	<ul style="list-style-type: none">• Good.
Monitoring and Evaluation	<ul style="list-style-type: none">• Easily monitored and evaluated however this is costly.
Landholder acceptability	<ul style="list-style-type: none">• Covenants reduce landholder flexibility. Landholders are reluctant to change land title.• Process is relatively simple.• Little financial incentive.
Community/Government support	<ul style="list-style-type: none">• Voluntary and relatively inexpensive therefore well supported.

Although satisfied with the voluntary nature of these schemes, landholders consulted as part of this study expressed their unwillingness to change the title of their land. This would severely limit potential involvement in covenants and therefore its effectiveness as an incentive mechanism.

Grants and Subsidies

A traditional way of achieving on-ground conservation on both public and private land has been through the provision of grants and subsidies from both government and non-government organisations and coordinated by community conservation groups such as Landcare. A criteria assessment of grants and subsidies as a mechanism for promoting conservation management is presented in Table 5-E.

TABLE 5-E

Opportunity Assessment for Grants and Subsidies

Targetability	<ul style="list-style-type: none"> Regional groups can target on-ground action to high priority areas if these sites have been identified.
Ongoing management	<ul style="list-style-type: none"> Little incentive for ongoing management.
Cost Effectiveness	<ul style="list-style-type: none"> Reliance on community volunteers can reduce budgetary costs. Funds can be targeted at high priority areas.
Transparency	<ul style="list-style-type: none"> Consultation indicated some concern with selection bias. Areas conserved can be easily identified. If adequate “before” information is available on the status of the resource, benefits can be measured.
Monitoring and Evaluation	<ul style="list-style-type: none"> One-off nature of many on-ground works and budgetary constraints limits the ability for monitoring and evaluation.
Landholder acceptability	<ul style="list-style-type: none"> Often funding must be spent in a given time period resulting in works being undertaken in unfavourable seasonal conditions. Application process can be tedious. Some financial incentive.
Community/Government support	<ul style="list-style-type: none"> There is generally community and government goodwill surrounding these types of programs.

Landholders were generally happy with the provision of grants and subsidies through Landcare and other conservation organisations. In many cases grants and subsidies provided the incentive needed to undertake on-ground actions, however, some landholders indicated that they were likely to have undertaken the works anyway.

There was some concern relating to the targetability and transparency of grants and subsidies programs. It was felt that due to the various number of sources for this type of funding, objectives were not consistent and projects tended to be allocated haphazardly. There was some suggestion that money tended to go to the same groups of landholders and that due to inadequate knowledge of city based assessment personnel applications could be prepared in such a way that selection could be biased.

Competitive Bidding Mechanisms

Recent conservation initiatives aimed at encouraging wider participation by targeting profit driven landholders involve competitive bidding mechanisms such as tender and auction schemes. An assessment of competitive bidding mechanisms is presented in Table 5-F.

TABLE 5-F

Opportunity Assessment for Competitive Bidding Mechanisms

Targetability	<ul style="list-style-type: none"> • Targets can be built into a biodiversity benefits index. • Has the potential to increase participation by targeting profit driven landholders hence increasing the area available for conservation.
Ongoing management	<ul style="list-style-type: none"> • Linking annual payments to outcomes encourages ongoing management.
Cost Effectiveness	<ul style="list-style-type: none"> • Is more likely to maximise conservation benefits for a given budget. • May be significant costs involved in setting up an auction/tender scheme, enforcing contracts and evaluation of the program.
Transparency	<ul style="list-style-type: none"> • Benefits can be identified and measured using a biodiversity benefits index. • Measures should be taken to ensure that schemes run by non-government organisations remain accountable.
Monitoring and Evaluation	<ul style="list-style-type: none"> • Easily monitored and evaluated however this is costly.
Landholder acceptability	<ul style="list-style-type: none"> • Flexibility can be built into tender contracts. • Participants indicated a simple process for involvement. • Payments take into account individual opportunity costs, direct costs and landholder benefits.
Community/Government support	<ul style="list-style-type: none"> • Voluntary participation is well accepted. • Setting up an auction/tender scheme can be time consuming and expensive. • Achievement of greatest conservation outcome at minimum cost is attractive.

Landholders tended to have limited knowledge of this type of mechanism. Those landholders who were familiar with schemes of this nature were attracted to the idea of receiving payments that reflected opportunity costs of lost production and ongoing management of the site. They also felt that tender schemes ensured both participants and administrators were held accountable and were subject to ongoing monitoring. This ensured that expenditure was directly linked to specified outcomes. A potential drawback of this type of mechanism is that some landholders who were previously prepared to provide voluntary conservation for little or no incentive may now prepare bids.

Conclusion

Consultation with landholders indicated that schemes of a voluntary nature that allowed for flexible management of biodiversity and native vegetation alongside other land management objectives are preferred. Landholders indicated that there were likely to be areas of remnant vegetation with marginal production value on most private properties across the Nandewar that could be preserved without the need for further incentive.

To secure conservation outcomes on higher value areas, landholders indicated that financial incentives would be required. Financial incentives would need to encompass opportunity costs associated with lost agricultural production as well as direct costs associated with managing the site to maximise conservation values. A competitive bidding system was the preferred approach for achieving the greatest conservation objectives at the least cost whilst ensuring a transparent and highly accountable system.

5.5 SUMMARY AND RECOMMENDATIONS

Summary

This chapter has provided an overview of conservation incentive theory, incentive mechanisms available in NSW, issues relating to the setting of financial incentive levels and commercial opportunities for profitable conservation. In summary:

- Three types of policy options for conservation of native vegetation and biodiversity were identified: extension and motivation; property rights instruments; and financial incentives instruments. The existing policy environment includes a mix of all three types.
- A preferred approach to incentive design incorporates landholder-bidding mechanisms, such as the Liverpool Plains Land Management Tenders, which encourages volunteer landholders to reveal their financial incentive requirements. This approach to setting incentive payments is currently not available to the majority of landholders in the Nandewar Bioregion although there is some overlap with the LPLMC trial.
- As well as providing an avenue for the generation of incentive payments, conserving native vegetation may provide landholders with opportunities for commercial return.

Recommendations

Based on the information presented in this chapter, Hassall & Associates makes the following recommendations relating to conservation management and the use of incentive mechanisms in the Nandewar Bioregion:

- In the first instance, conservation targets and objectives should be clearly identified with priority areas and intended outcomes clearly defined. Budgetary constraints must also be considered to ensure that the greatest conservation outcome is achieved for a given level of funding.
- It is recommended that the conservation potential of Travelling Stock Routes in the Nandewar Bioregion be further explored. This may involve implementation of management agreements to establish cooperative arrangements that allow for continued grazing activity whilst conserving native vegetation and biodiversity.

- Consultation with landholders indicated that remaining timbered areas in the bioregion could be targeted for conservation at relatively low cost. It is recommended that funds in the form of grants and subsidies be directed at providing assistance for fencing of areas and ongoing management costs to ensure that the potential conservation values of these areas are realised.
- If it is deemed that conservation of land with higher agricultural production value is desirable in the Nandewar Bioregion, landholders are likely to require payments that reflect their lost production value and management costs. A competitive bidding system is the preferred approach for achieving the greatest conservation objectives at the least cost whilst ensuring a transparent and highly accountable system. The design requirements of such a scheme should not be underestimated. However lessons learnt from the LPLMC, DIPNR's Environmental Services Scheme and the Victorian Bush Tender Trials can be incorporated.
- Future monitoring and evaluation of any adopted incentive scheme is imperative for ensuring a transparent system that is acceptable to all stakeholders. Monitoring and evaluation costs should be factored into scheme budgets.
- A package of extension material should be prepared either separately or as part of the WRA. The package should be aimed at educating both landholders and the wider community. This package would provide a means of information exchange between landholders, the community and government. The package would involve information on:
 - The on-farm benefits of native vegetation retention backed with local case studies;
 - Recognition and promotion of local "champions" or role models who have achieved significant conservation outcomes in conjunction with other land management objectives;
 - Simple summaries of existing voluntary incentive schemes; and
 - Information detailing the requirements of NSW government conservation legislation and how a voluntary incentive scheme for private land conservation is distinct from legislative requirements. Recent legislation (eg. NVC Act and TSC Act) is at least in part responsible for high levels of government distrust amongst landholders.

6 Study Conclusions

The purpose of this study was to provide an analysis of development opportunities in the Nandewar Bioregion in relation to forest based industries, Aboriginal development, minerals, construction materials and petroleum, and conservation. The study conclusions are summarised below.

Forest Based Industries

- High priority opportunities include:
 - Further processing of cypress timber, especially pre-finishing of product for export markets;
 - Supplementary cypress thinning consistent with the Red Chief LALC business case; and
 - Tourism and recreation – new camp grounds fronting the McIntyre and Gwydir Rivers.
- Of medium priority were opportunities for silviculture; commercial apiary; utilisation of cypress by-products; and tourism opportunities for maps and guides, walking and access tracks and collaborative tours.
- Other opportunities identified but assessed to be of low priority include: hardwood and other native timber products; plantations, woodlots and agroforestry including effluent irrigated woodlots; renewable energy industries – wind farms; apiary – native bees; grazing, including the harvesting of native meats; development of a regional tourism strategy; and integrated natural resource management.

Aboriginal Development

- High priority opportunities include:
 - Supplementary cypress thinning;
 - Public sector employment; and
 - A group of opportunities that includes cultural heritage tourism, arts and crafts production and retailing, and bushfoods retailing.
- Opportunities considered to be of medium priority include plantations/nurseries on Aboriginal owned land and a Green wood firewood industry.
- Other opportunities identified but assessed to be of low priority include large scale investment in a mill, apiary – commercial and native bee, Aboriginal studies and a site assessment consultancy.

Mineral, Construction Material and Petroleum

- Minerals exploration and production are an important economic opportunity in the Nandewar.
- The most prospective mineral resources are coal and magnesium.
- There is some exploration in the region for petroleum and gas deposits.

Conservation Opportunities

- In the first instance conservation targets and objectives for the Nandewar need to be finalised and priority areas clearly defined.
- High priority conservation opportunities include
 - Provision of education and extension material aimed at explaining the native vegetation reform process, outlining conservation objectives, and identifying available schemes and scheme champion;
 - Exploring the conservation potential of travelling stock routes as important habitat and corridors; and
 - Targeting existing timbered areas of low agricultural value.
- Of low-medium priority is the provision of funds for encouraging conservation on high opportunity cost land through development of a competitive bidding scheme.

7

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8 Persons Contacted

Person Contacted	Affiliation/Interest
General	
Harding, Jane	Baradine Progress Association
Hayman, Ted	Pilliga Forest Users Association plus contracting business – felling, hauling and processing
Huckel, Andrew	NSW Farmers
Neirinckx, Amanda	RACD, DIPNR
Powell, Roy	CARE
Still, Tim	RACD, DIPNR
Thompson, David	CARE
Patrick Paul	Gunnedah Timbers (mill)
Werrin, Doug	TEMS
Plantations	
Royal, Brian	SFNSW – Queanbeyan
Cameron, Nick	SFNSW – Pennant Hills
Tourism and Recreation	
Mead, Jenny	Bingara Shire Council
Fletcher, Robin	Manilla Shire Council
Malloy, Pat	Barraba Shire Council
Moulds, Les	Inverell Shire Council
Hancock, Peter	Tourism New South Wales
Apiary	
Sunderland, Kieran	Apjarists
Weis, Bill	President, NSW Apjarists Association, Glen Innes
Renewable Energy	
Williamson, Andrew	Wind Business Manager, SEDA
Specific Forest Industry	
Ainley, Russ	Forest Products Association

Person Contacted	Affiliation/Interest
Aboriginal Opportunity	
Allan, Troy and Gwenda	Mirii Yuligi (star dancers)
Anderson, Donella	Manager, Nandewar Western Regional Assessment, DEC
Bird-Gardiner, Tracy	DIPNR
Beale, Peter	Red Chief LALC, Land Development Officer
Brown, Michael	Gunya Gunya, CDEP
Chatfield, Joan	Manager Cultural and Heritage Assessment Western Regional Assessment, DIPNR
Crawford, Evelyn	Manager Cultural and Heritage Assessment WRA, DIPNR
Craigie, Paul	Indigenous Officer, New England North West Area Consultative Committee also Treasurer Tamworth LALC
Connors, Jimmy	Mrangalli CDEP
Fife, Ray	Archaeologist
Johnson, Ivan	Tamworth Aboriginal Land Council
Naden, Hilton	NPWS, heritage
Seiver, Anthony	Department of Aboriginal Affairs
Walford, Shirley	Resident Tingha
White, Narelle	Secretary Tamworth LALC
Whitehead, Austin	SFNSW
Minerals	
Pecover, Simon	Pan Gem, gem miner Inverell district
Wright, Kim	NSW Minerals Council
McEvilly, Roger	DMR
Watkins, John	DMR
Conservation	
Clancy, Brian	Gwymac Landcare
Scott, Fiona	NSW Agriculture
Stewart, Brenda	Manilla Landcare
* The names of landholder participants in regional focus group sessions have been withheld.	

A Appendix 1

A1.1 VICTORIAN BUSHTENDER TRIAL

Background

BushTender provides farmers with the opportunity to receive payment for entering into agreements to provide management services that improve the quality or extent of native vegetation on their land.

The original 3 year trial project managed by the Victorian Department of Natural Resources and Environment covered two trial areas in the North East and North Central Catchment Management Areas of Victoria. \$600,000 was allocated to the BushTender program, of which \$400,000 was earmarked for landholder payments. In February 2002, offers were made to 73 landholders with successful bids covering an area of nearly 3,200 ha.

In 2002, under a renamed Department of Sustainability and Environment, the programme was extended to the Gippsland area of Victoria. Of 51 landholders submitting bids, 33 were successful and have now signed management agreements for either 3 or 6 year periods. In total 1,684 ha of vegetation will be protected at a cost of \$800,000 set aside for the management agreements.

How does it work?

BushTender is an auction-based approach that enables landholders to establish their own price for the native vegetation management services they are prepared to offer on their land. This price forms the basis of their bid, which is then compared with the bids from all other landholders participating in the process.

Bids are assessed on the basis of:

- Current conservation value of the site (measured through a biodiversity significance score (BSS));
- Amount of service offered by the landholder (measured through a habitat services score)); and
- Cost as provided in the landholder bid.

This information is used to calculate a Biodiversity Benefits Index (BBI) for each site according to the following formula:

$$\text{BBI} = \frac{\text{BSS} * \text{HSS}}{\text{BID}}$$

The successful bids are those that offer the best value for money.

Outcomes

Benefits of the BushTender trial to landholders include the flexibility to tailor bids to suit individual circumstances and the opportunity to generate a regular and reliable income stream from their native vegetation.

The community benefits include improvement in the quality and extent of native vegetation in the trial areas delivered in a cost-effective manner.

Following the success of the BushTender trial, two new pilot programs aimed at improving the current extent and quality of native vegetation within Victoria have been developed.

A1.2 UNITED STATES CONSERVATION RESERVE PROGRAM

Background

The Conservation Reserve Program is a voluntary program available to agricultural producers to help them safeguard environmentally sensitive land. It is run by the US Department of Agriculture's Farm Service Agency (FSA) and provides participants with rental payments and cost share assistance to establish long-term, resource conserving covers on eligible farmland.

The CRP program has been running since 1997 and involves over 650,000 signed contracts, protecting over 14 million hectares. The annual rental payments are US\$1.6 billion or approximately US\$118 per hectare.

How does it work?

Producers with eligible lands compete nationally for acceptance based on an environmental benefits index (EBI) during specified general sign-up periods. If the land is environmentally desirable land devoted to certain conservation practices it may be enrolled at any time.

Farmers are required to outline a cover practice that will be applied to the offered land to re-establish vegetation. Factors that contribute to the EBI include wildlife habitat benefits, water quality benefits from reduced erosion, runoff, and leaching, on-farm benefits from reduced erosion and air quality benefits from reduced wind erosion.

For land to be eligible for the program it must be either:

- Cropland that has been planted for 4 of the previous 6 years from 1996 to 2001; or
- Certain marginal pastureland.

In addition cropland must also satisfy one of the following criteria:

- Meet an erosion index criteria;
- Be expiring CRP acreage; or
- Be located in a national or state CRP conservation priority area.

The Commodity Credit Corporation (CCC) makes annual rental payments based on the agriculture rental value of the land, and it provides cost-share assistance for up to 50 percent of the participant's costs in establishing approved conservation practices. Participants enrol in CRP contracts for 10 to 15 years.

Outcomes

By reducing water runoff and sedimentation, CRP protects groundwater and helps improve the condition of lakes, rivers, ponds, and streams. Acreage enrolled in the CRP is planted to resource-conserving vegetative covers, making the program a major contributor to increased wildlife populations in many parts of the country.

The success of the scheme has meant that demand to enrol land in CRP is expected to be greater than the amount that FSA can accept. A limit of just under US\$16 million has been set as the maximum CRP enrolment.