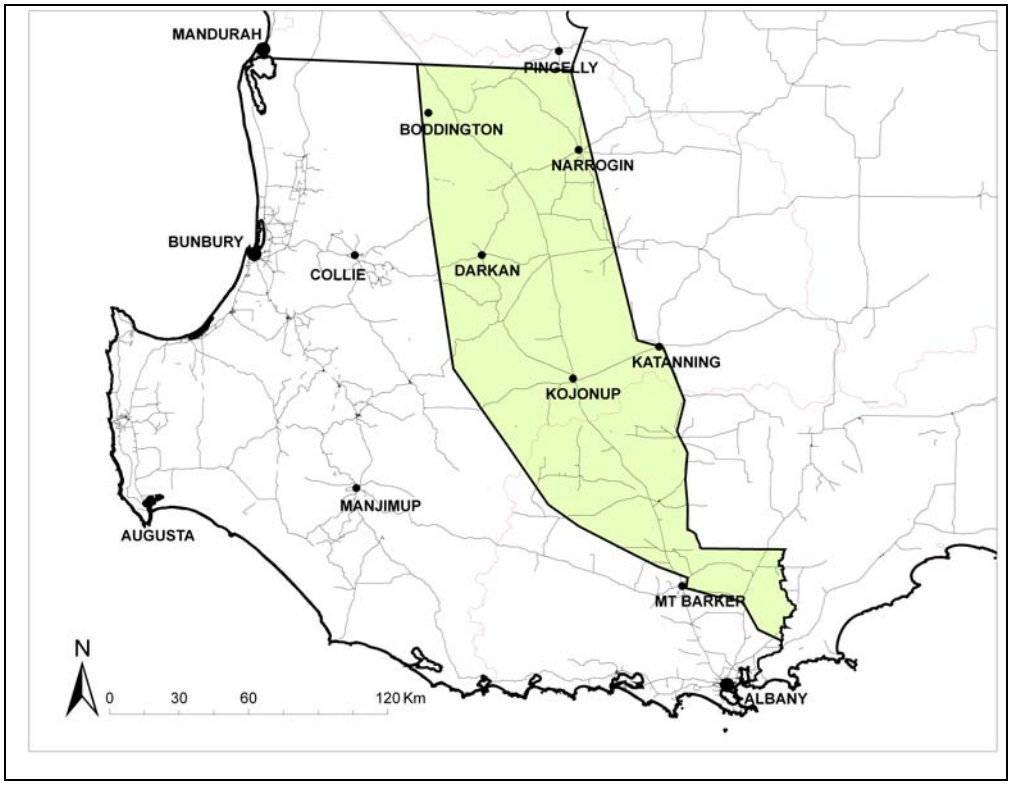
Forest Products Commission's

Tree Farming and Industry Development Plan:

A 20 year vision

Eucalypt Sawlog

Central South West Recovery Catchments



July 2006

Government of Western Australia

Forest Products Commission
WESTERN AUSTRALIA

Turning the vision into reality

Forest Products Commission (FPC) has been planting trees for wood and environmental benefits for many years. The **Tree Farming and Industry Development Plans ("Development Plans")** clarify FPC's tree planting goals and direction. Individual plans have been created for four regional areas which make detailed recommendations for the planting of specific species, taking into account local conditions.

In September 2002, the Western Australian Government launched the Action Plan for Tree Farming, which outlined the Government's intent to pursue environmental and timber supply objectives by planting trees. The Development Plans describe how FPC intends to realise the vision of the Action Plan for Tree Farming.

The FPC has used its knowledge as a plantation manager together with other specialist information, to deliver the most comprehensive framework for regional forest-related industry development ever prepared for the State.

This plan for the Central South West Recovery Catchment identifies two key, or 'driver', species for the area – Sydney bluegum (*Eucalyptus saligna*) and sugar gum (*Eucalyptus cladocalyx*). These species have an ability to grow well over large areas, and if planted in sufficient quantity, could stimulate the development of downstream forest products industries.

The driver species were selected after assessing local factors including wood properties, climate, soil type, hydrology and landforms. The FPC has undertaken an extensive review of timber supply and demand to ensure that there would be future markets for products from these species.

Realising the vision of the Development Plans will require a coordinated effort across all levels of Government, the private sector, natural resource management (NRM) groups and industry bodies.

The environmental benefits of trees are well known, but the Development Plans outline how planting enough trees can have a meaningful environmental impact while creating jobs and stimulating the local economy for the benefit of everyone.

Responding to Comment

This Development Plan has been finalised by the FPC following an extensive consultation process with local communities, local and State Governments, natural resource management groups, and private industry and other stakeholders between May 2005 and January 2006.

FPC will review the direction of its Tree Farming and Industry Development Plans from time to time. Any comments on the Plans should be sent to the Manager of FPC's Industry Development Branch at Locked Bag 888, Perth Business Centre, WA. 6849.

TREE FARMING & INDUSTRY DEVELOPMENT PLAN

EUCALYPT SAWLOG RECOVERY AREA

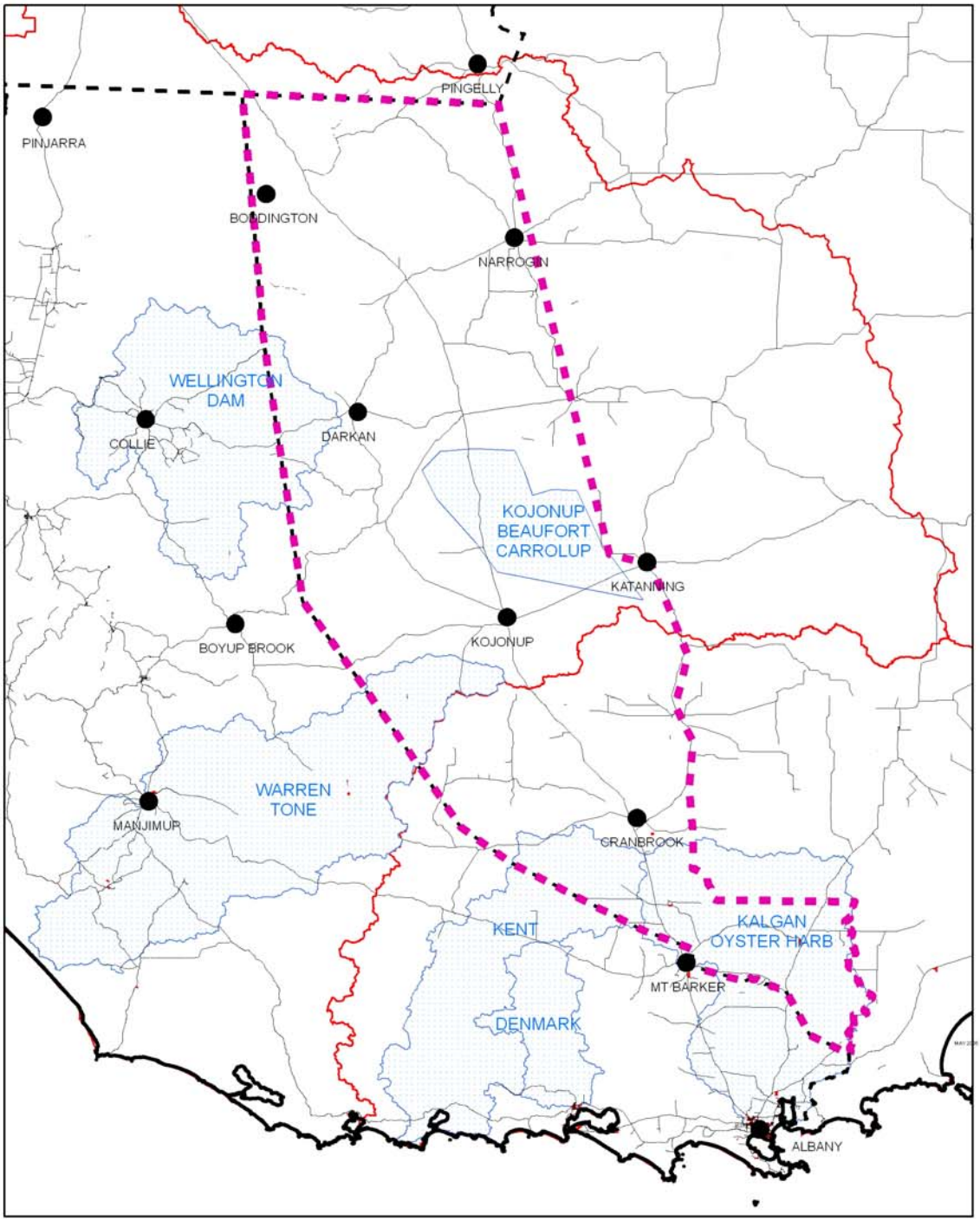


FIGURE 1: TARGET AREA FOR EUCALYPT SAWLOGS AND RECOVERY CATCHMENTS

EUCALYPT SAWLOG RECOVERY AREA

RECOVERY CATCHMENTS

0 25 50 100 Km

JULY 2006

Introduction

Growing demand for timber from traditional and emerging markets and the worldwide pressure to reduce native timber harvesting have opened the door to expanding Western Australia's plantation-based industry.

Western Australia already has a proven track record in timber plantations. Broadscale planting of blue gums in the late 1980s and 1990s spawned new forest industries and economic drivers for the State, which will continue to be significant into the future.

The Tree Farming and Industry Development Plan for the core of the Central South West Recovery Catchments (see Figure 1) provides farmers and investors with tree farming options that are suited to the environmental conditions and farming systems of the area.

Planting the right trees in the right places in the right quantities will deliver the environmental, economic and social benefits to support and create viable and sustainable local industries and communities.

The Threat from Salinity & Waterlogging

The region's agricultural economy is at significant risk from salinity and rising water tables. However, figure 2 shows that there is an opportunity for recovery over a large proportion of the core target area by extensive planting of trees integrated with other measures such as perennial pastures and drainage.

Figure 3 shows that the soils of the core target area are suitable for widespread planting of commercially grown eucalypts. With a cleared area of 1.4 million hectares, over 200 000 ha of land is highly suitable for growing eucalypts. Figure 3 also shows there are large areas of suitable soils to the west and south-west of the core area.

The Central South West area includes water catchments that could supply potable (drinking) water in the future, and several areas of high conservation value.

Wellington Dam, fed by the Collie River, holds approximately 49 per cent of the entire South West's harnessed water supply. Water from the dam is currently used for irrigation but the State Government has a target to reduce salinity of the Wellington Dam to potable levels by 2015, and a similar target for the Warren/Tone catchment by 2030.

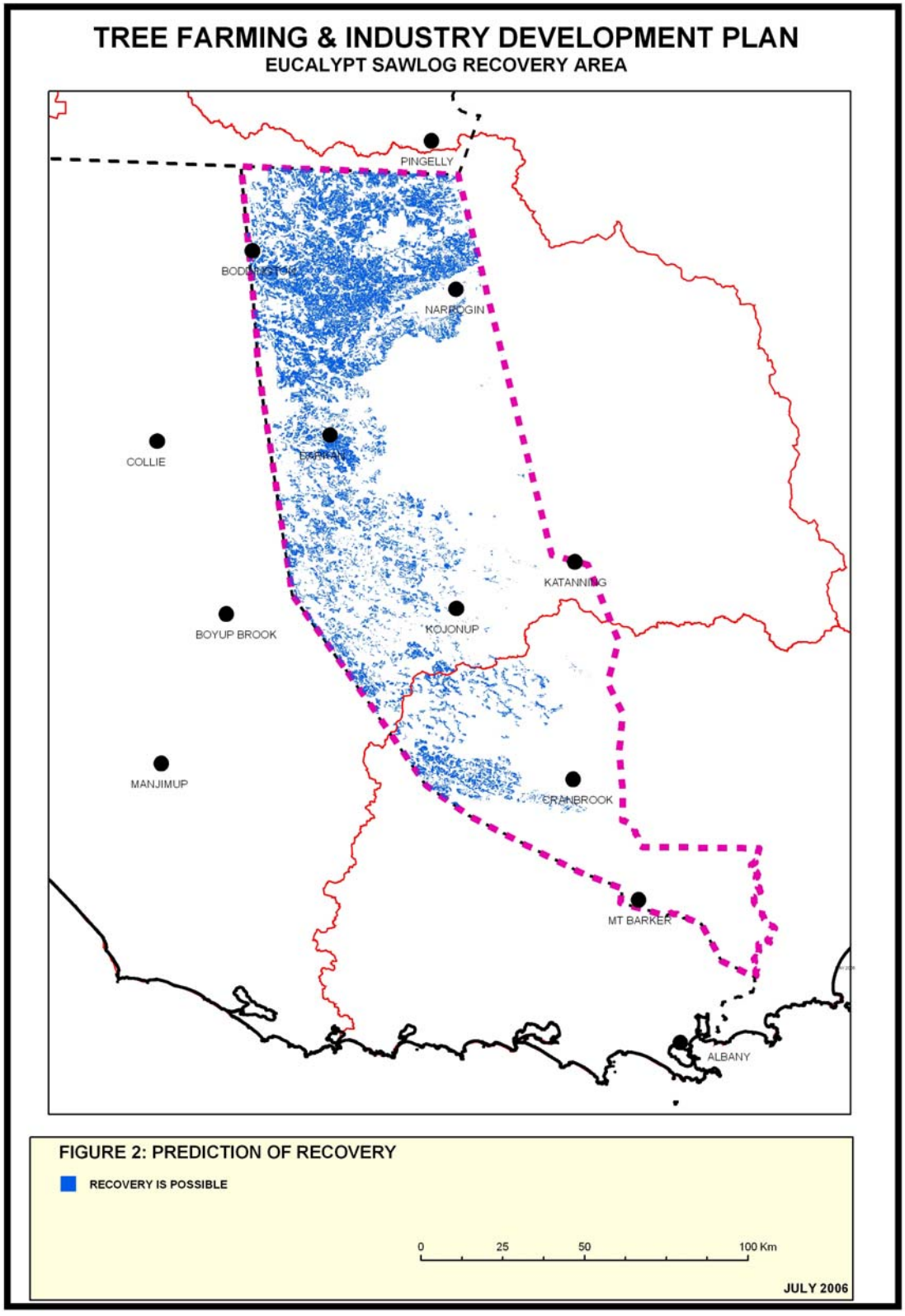
These targets will only be achieved by changes in land management that include the planting of commercial trees, high water use by agricultural systems and engineering options to reduce salinity levels.

The gradients of the landscape of most of the region are sufficient for significant lateral flow of groundwater. This means that the strategic placement of trees can impact by reducing local water tables. Saline or high water table areas within the local landscape can be recovered and rising groundwater halted before it reaches critical levels. Where recovery cannot be achieved, strategic tree farming can contain rising groundwater. Where neither recovery nor containment are achievable, trees with a high tolerance of water and salt may be part of an adaptation strategy.

Integrating trees with farming in the headwaters of the key catchments of Collie, Warren/Tone and Kent can limit dryland salinity and waterlogging as well as reduce stream salinity levels. Reducing the export of nutrients and salinity from the middle Kalgan catchment will have a beneficial impact on Oyster Harbour.

The Kojonup-Beaufort-Carrolup river flats area is recognised as an area of high biodiversity (Salinity Investment Framework Analysis: 2004) because of the natural variety of the landforms, range of flora, and habitats for native fauna. Planting trees adjacent to these areas will help to reduce the impact of waterlogging on this important asset.

Strategic integration of trees onto farms can substantially recover or contain land salinity and waterlogging over large areas of farmland that are in the Blackwood, Murray and Frankland catchments.



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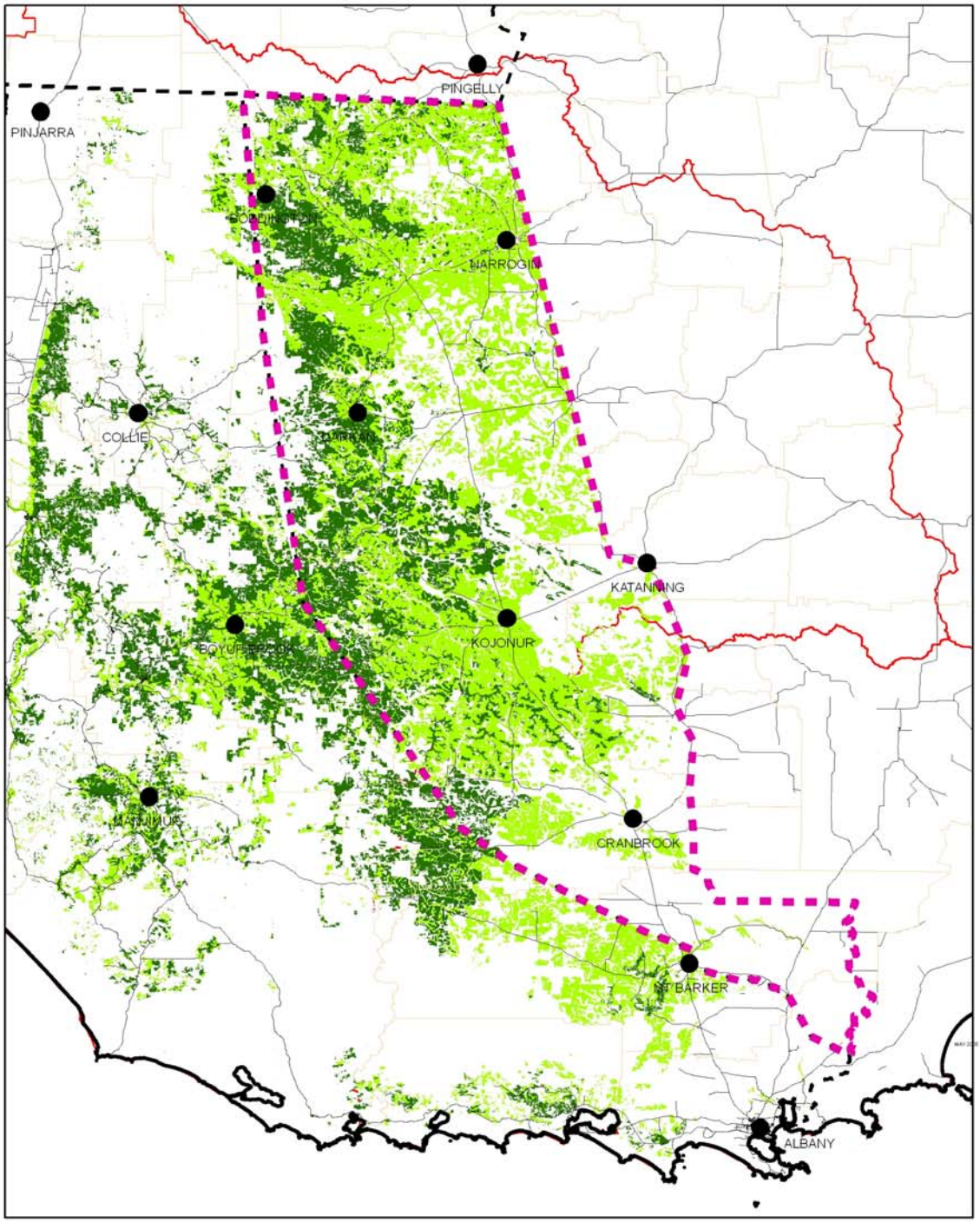

FIGURE 3: CONCENTRATION OF CLEARED LAND SUITABLE FOR EUCALYPTS*

EUCALYPT SAWLOG RECOVERY AREA

HIGH CONCENTRATION OF SUITABLE SOILS ON CLEARED LAND

MODERATE CONCENTRATION OF SUITABLE SOILS ON CLEARED LAND

0 25 50 100 Km

JULY 2006

The Opportunity

Market and Industry Opportunities

The South-west region of WA supports a range of forest product industries based on hardwood sawmills and associated value adding. There are also major wood processing plants including the State's largest pine sawmill located at Dardanup and large scale factories utilising forest residues, as well as woodchip export facilities (see figure 5).

The State's Forest Management Plan of 2004 capped the harvest of native hardwood timber for sawlogs (jarrah and karri) at 185 000m^3, compared with about 800 000m^3 under the previous Forest Management Plan (1993-2004). However, the demand for timber continues to grow and this changing environment has created opportunities to replace native hardwood timbers with plantation timbers with similar characteristics.

It is estimated that by 2030 there could be a deficit within Western Australia of more than 200 000m^3 of sawn timber. The experience in WA of declining sources of native hardwoods is echoed around the world as hardwood availability declines in most native forest producing areas in Asia and other parts of the Southern Hemisphere.

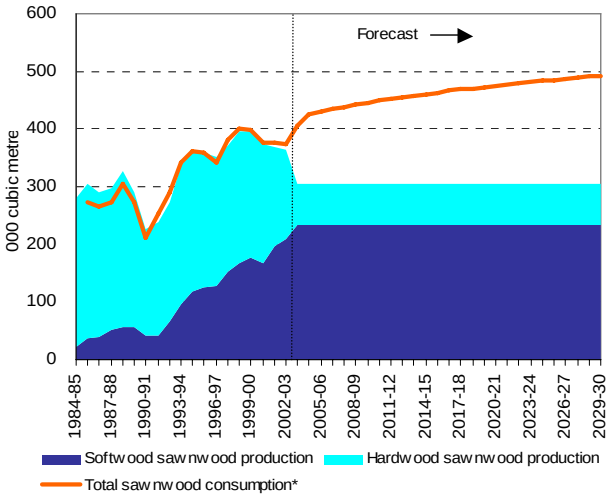

Figure 4: Actual & Forecast Sawnwood Trends for Western Australia

In addition to supplying existing industries, other value-added processing industries could be developed from sawlogs and forest residues for uses that will provide further economic and social opportunities at a regional and local level.

Asian paper and pulp mills are expected to continue increasing demand for Eucalypt tree crops. These were planted extensively during the 1980s and 1990s in WA to meet expected demand from Japan and Korea.

WA is the largest producer of sandalwood in the world and there is an opportunity to expand sandalwood production on farmland. Sandalwood is exported as well as being processed into oil based products near Albany.

A summary of existing and potential opportunities in the project area and surrounding areas is summarised below:

Existing, planned or under construction	Hardwood sawmills – Collie, Greenbushes and Manjimup areas Pine sawmill – Collie and Dardanup Mallet processing near Narrogin Power stations - Collie (power generation with renewable fuels) Post treatment – Mt Barker Sandalwood factory near Albany
Potential	Pulp mill - Collie Local sawmill(s) Veneer plant Value adding industries eg. furniture, flooring, kiln drying Engineered wood products, e.g. MDF, particle board or ESL Firewood and fencing Bioenergy - renewable products such as plantation residue to produce energy Co-generation - supplementing existing energy sources with residue products

Figure 5 Showing Major Sawmill & Timber Processing Facilities (printed separately as A3)

Species

Following a review of the known growing patterns of different tree species, their wood properties, the local conditions, including soil, hydrology, evaporation and rainfall, several species have been identified as being suitable for the Central South Recovery Catchments to achieve environmental, social and economic benefits.

The 'driver' species for the area are:

Sydney bluegum	*Eucalyptus saligna*
Sugar gum	*Eucalyptus cladocalyx*

Furniture Made from Sydney Blue Gum

Both species are viable alternatives to native timbers because of the quality of their strength and appearance. Sawlogs would produce appearance grade timber that could be used in high-value uses such as furniture, flooring and architraves.

The targets for new plantations, required in this plan to stimulate downstream processing and job creation, are based on the planting of the driver species. The area is, however, also suitable for a number of other species, which over time, could provide the impetus for even further industry development. These 'support' species are:

Tasmanian bluegum	*Eucalyptus globulus*
Maritime pine	*Pinus pinaster*
WA sandalwood	*Santalum spicatum*

Future Processing and Planting Options

Primary Product

It is estimated that planting 2000 ha of eucalypts per year for 20 years could provide the critical mass to support the establishment of commercially viable downstream processing and manufacturing industries.

Preliminary investigations suggest that there are opportunities for one of two types of mill operations: a modern sawmill to process either logs for solid wood manufacturing; or a mill to peel logs for veneer making and the manufacture of plywood.

Processing type	Current sizes		Future sizes* (2030)			Future hectares required
	Input (000 m^3)	Output (000 m^3)	Input (000 m^3)	Output (000 m^3)	Capital cost ($AU million)	
Sawmill	20-125	8-50	150-250	75-125	50	40 000
Plywood mill	250	100	375	150	100	55 000

Proposed processing option

* Based on URS Forestry Internal Report 2003.
Forecasts are based on predicted growth rates / expected utilisation of harvest for each processing type.

The establishment of a new sawmill is the preferred option for downstream processing in this area. Fewer hectares are required to establish a sawmill compared to a plywood mill, but the suggested planting regimes included in the plan will result in trees that are suitable for both types of mill should market demand change to favour a plywood mill in the future.

Opportunities also exist to supplement the supply to existing native forest sawmills in the South West. Timbers from eucalypt plantations that display similar characteristics to highly-prized native forest timbers such as jarrah, are expected to be premium timbers of the future.

Between Tonebridge and Mt Barker, growing eucalypts for sawlogs south west of the cell may be undertaken without compromising FPC's Radiata Pine expansion goals. This area has not been included in the core of the cell because of the current strong competition from the bluegum industry.

Residue Product

More opportunities are emerging for residue products in a worldwide trend to maximise the value of timber harvesting. Uses include providing biomass as a renewable energy source and chips for pulp and paper making and resource for engineered wood products. Identifying markets for these products could lead to new regionally-based industries or export markets in addition to local downstream processing opportunities.

Employment

Expanding plantations in the Central South West Recovery Catchments has the potential to provide a major stimulus to employment opportunities in the region.

Based on the plantation target of 2,000 hectares per year for 20 years, and assuming that plantations are replanted after harvest, the following number of direct and indirect jobs could be created.

	When	Jobs [1]
Direct Employment		
Planting, tending, maintaining and harvesting [2]	by yr 1 by yr 10 by yr 20	20 64 100
Sawmilling (log input 150 000m3/yr)	by yr 20	150 - 200
Value adding (flooring, furniture, joinery)	by yr 20	170 - 200
Direct employment by yr 20		**420 - 500**
Indirect employment [3] by yr 20		**1050 - 1250**
Total employment by yr 20		**1470 - 1750**

[1] Jobs are full time equivalents. Direct employment figures are from report by BIS Shrapnel.

[2] Employment in plantation activities rises steadily and plateaus when estate size is reached and harvesting and replanting are underway.

[3] Employment multiplier of 2.2

The plantation industry has the potential to redress declining populations in regional centres such as Darkan, Boyup Brook and Katanning.

Implementation

One of the FPC's roles is to promote the forest products industry in Western Australia, other groups such as State agencies, regional NRM groups, Local Government, farmers and the private sector have a stake in the introduction of large scale tree farming and the development of associated industries.

To implement this plan, the FPC will continue to work with local interest groups to identify avenues to achieve target planting levels, which will deliver a range of benefits at a regional level.

It is expected that funding for the implementation of the plan will come from a mix of sources including the FPC's own planting; the FPC's share farming program; federal salinity funding (through the National Action Plan for Salinity & Water Quality); and the private sector.

Planting trees in some areas will be more commercially attractive if income can be generated from other sources such as carbon trading and salinity credits, which the State Government is actively pursuing.

The realisation of these opportunities is likely to have a positive impact on achieving the objectives of this plan.

Based on interaction with key stakeholder groups there are a number of initiatives that will be undertaken in the future to improve the Development Plan:

1. Continual development of species and production opportunities from the existing plantation resource.

2. Appropriate silviculture and site selection to meet water quality and commercial objectives.

3. Monitoring the impact of tree planting on water tables and associated environmental impact.

4. Continue to work on small scale processing opportunities for Maritime Pine and other species.

Appendix 1 - Planting Eucalypts for the Future

Planting Conditions

The soil and climate of the area are suitable for the growing of eucalypts, which require sandy to gravelly clay loam up to 3 m in depth and a rainfall of 500 mm or more. Figure 3 shows the distribution of soil landscape groups on cleared land that have a high or medium concentration of soils suitable for eucalypts.

While this plan supports the planting of eucalypts to generate downstream processing, species such as Maritime pine (*Pinus pinaster*), which requires deep sandy soils, and Sandalwood (*Santalum spicatum*), which can adapt to a wide range of soil types, are also suited to the area if there is interest in developing these plantations in the future.

The area covered by this plan includes the water catchment areas of the Central South West of Western Australia. The area is largely used for mixed agricultural purposes such as grazing and crops, including plantations. A review of the land types and land zoning has identified 218 000 ha suitable and likely to be available for the planting of eucalypts.

	Hectares	% of total
Total area	1 670 000	100
Cleared	1 380 000	83
Land for eucalypt planting	218 000	13

Silviculture (i.e. forestry management practices)

For the two nominated driver species.

Two main types of planting design are suitable for Sydney bluegum or Sugar gum, grown on a 20 to 25 year rotation.

1. **Tree Block** – planting trees that are well spaced in block formation will maximise diameter growth while using stored soil water and rainfall over the rotation. Final stocking is achieved by age four to seven years. High pruning will result in a higher quality log. Pasture growth will support reasonable levels of stock during the early years.

2. **Tree Belts** – are planted in north-south orientation where possible with wide spaces between belts. Spacing trees will maximise diameter growth while using stored soil water and rainfall over the rotation from an area wider than the tree belt. Final stocking is achieved by four to seven years. High pruning will result in a higher quality log. This approach gives greater weighting to other agricultural pursuits, with areas between belts able to support significant levels of stock or cropping during the entire rotation. Significant reduction of recharge is still possible, provided that the belts are planted extensively across the landscape.

Appendix 2 - Setting the Scene

Existing Plantations

More than 23 000 ha of trees have already been planted in both private and Forest Product Commission-managed plantations.

Species	FPC (ha)	Private (ha)
Tasmanian bluegum		10 953
Brown mallet	6 273	
River redgum	4	945
Sydney bluegum	215	235
Sugar gum	190	
Other eucalypts	339	1 793
Maritime pine	2 010	2
Radiata pine	997	399
Other	25	587
Total	**9 435**	**14 914**

Existing plantings, except for a small planting of Sydney bluegum and Sugar gum, are not 'driver' species identified in this Development Plan, but can potentially contribute to niche and residue markets in the future.

Infrastructure

The area includes the towns of Darkan, Cranbrook, Kojonup, Katanning and Boyup Brook, and all or part of the Shires of West Arthur, Collie, Boddington, Kojonup and Cranbrook (refer map).

The Central South West Catchments are part of the thriving South West region, which has a well established infrastructure base to support downstream processing of timber, as outlined below:

Power — The industry is well serviced but additional requirements will be necessary if new industries are established. A 220 kV line for major industry runs from Collie to Narrogin. Smaller distribution lines (132 kV) run from Collie north and from Collie south-east to Kojonup and on to Albany.

Water — The supply is adequate for the area's current requirements. Other resources are potentially available if required, but accessing these could require significant additional capital investment.

Rail — Freight rail infrastructure is limited. The main north-south line is located along the eastern part of the area.

Roads — There are sealed major roads in and out of the area. The Albany Highway runs nearly north-south through the area and along the eastern boundary, and major roads exist between Collie and Wagin and Boyup Brook to Katanning via Kojonup.

Port — Bulk loading is available, via Bunbury, Fremantle and Albany. Container shipping is available through Fremantle and is being investigated at Bunbury.