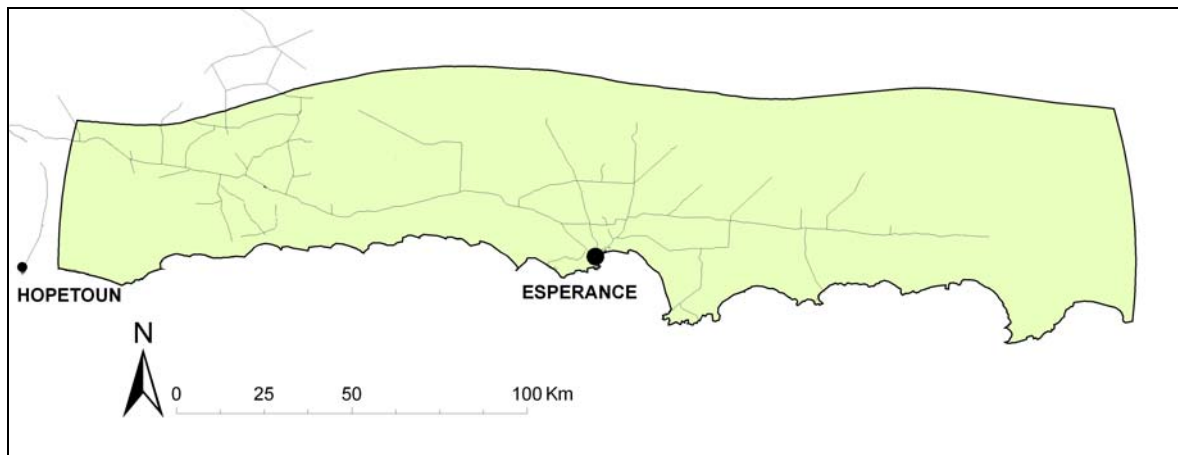


# Forest Products Commission's Tree Farming and Industry Development Plan: A 35 year vision

## Maritime Pine - Esperance



July 2006



## 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 Esperance region (see Figure 1) identifies one key, or ‘driver’, species for the area - Maritime pine (*Pinus pinaster*). This species has a proven ability to grow well over large areas in the Esperance region. A substantial target of 70 000 to 125 000 ha of Maritime pine has been identified as the critical mass required to stimulate the development of new downstream processing industry in the region.

Maritime pine has been selected as the driver species after assessing wood properties and local factors including climate, soil type, hydrology and landforms. The FPC has also undertaken an extensive review of timber supply and demand to evaluate markets for Maritime pine products for the future.

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

The environmental benefits of trees are well known, but this Development Plan outlines how planting a large number of trees can have a meaningful environmental impact in the Esperance region while creating jobs and stimulating the local economy.

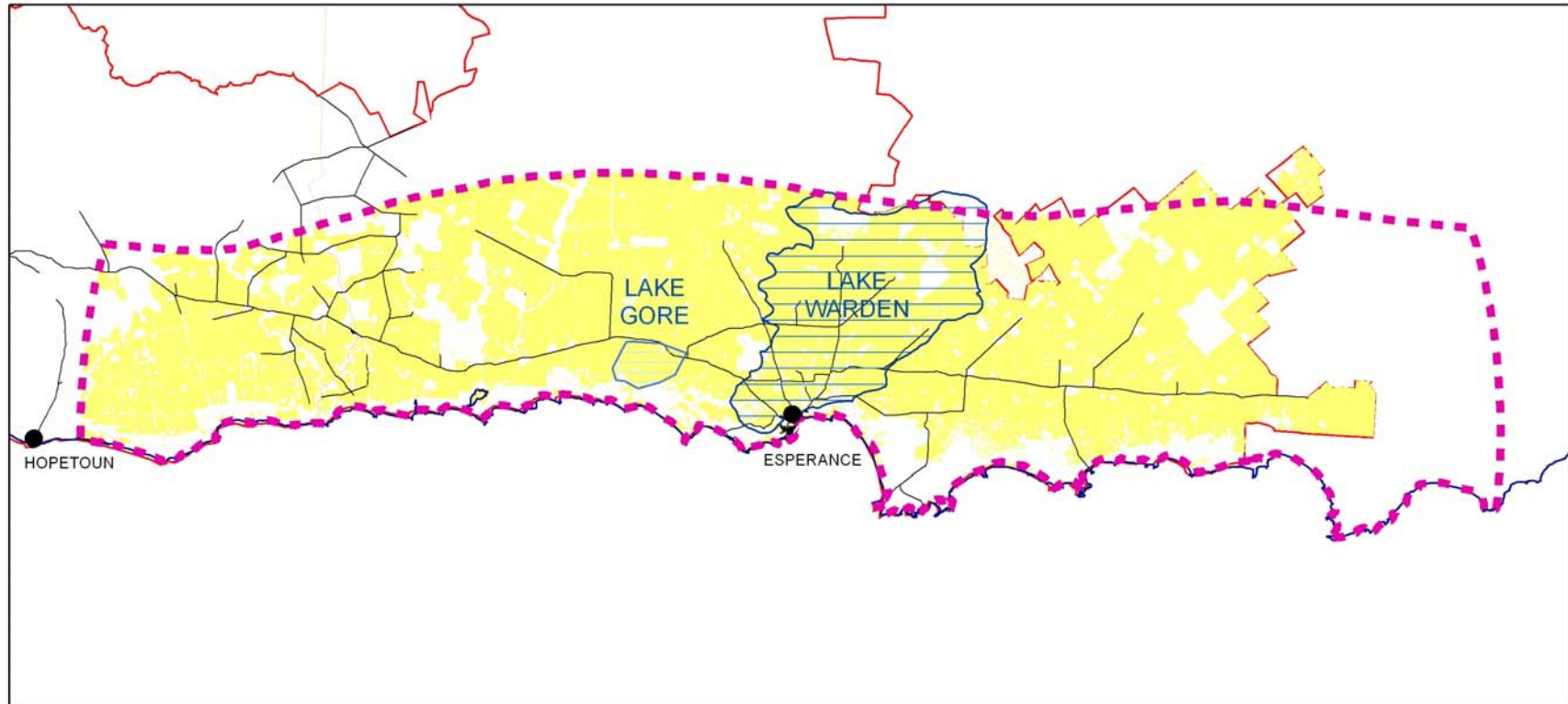
## Responding to Comment

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

## MARITIME PINE - ESPERANCE



**FIGURE 1: TARGET AREA FOR MARITIME PINE & RECOVERY CATCHMENTS**

-  TARGET AREA (400MM RAINFALL AND ABOVE)
-  DECLARED RECOVERY CATCHMENT
-  POSSIBLE RECOVERY CATCHMENTS



0 25 50 100Km

MAY 2005

## Introduction

Rising saline water tables are threatening the sustainability of cropping, grazing and biodiversity in the Esperance region. Widespread planting of trees, in conjunction with other landcare techniques can help to slow the rise in water tables, help to control wind erosion and protect stock and crops.

Of all the commercial tree species that can be grown in the Esperance region, Maritime pine is the one that can grow well under a wide range of soil and rainfall conditions. Trees grown to their full maturity will produce logs for peeling or sawing and chips for board manufacture, while thinnings produce smaller logs and chips

Growing demand for timber from traditional and emerging markets, in part driven by worldwide pressure to reduce native timber harvesting, has opened the door to expanding Western Australia's tree farming industry. Tree planting at a scale that can support internationally competitive forest industries also provides the opportunity to reduce the problem of rising groundwater.

Western Australia has a proven track record in timber plantations and forest industry development. Government plantations of Maritime and Radiata pine (*P. radiata*) are providing the sustainable resource for a range of large and small processing facilities. Since the early 1980s, government and private investment have funded widespread planting of pine and Tasmanian bluegum (*Eucalyptus globulus*) on farm land, to supply existing industry and spawn new industry opportunities.

Esperance's potential to grow commercial tree crops has recently been recognised and is demonstrated by significant plantings of Tasmanian bluegum tree crops on the higher rainfall areas within the region. Research on Maritime pine has shown that it has a tolerance to a wide range of soil fertility and rainfall and is therefore suited to a larger area of the region.



This Tree Farming and Timber Industry Development Plan for the Esperance region provides farmers and investors with tree farming options that can address the rising groundwater threat and can be integrated into the farming systems of the region. A coordinated regional effort of planting a large number of the right trees in the right places will deliver environmental, economic and social benefits to help sustain viable local communities.

## The Threat from Salinity & Waterlogging

The region's agricultural economy is at significant risk from salinity and rising water tables. Figure 2 shows the predicted salinity if no remediation work is undertaken. A large percentage of the cleared land in the target area may end up saline. These impacts could be substantially reduced by extensive planting of trees on recharge areas.

Figure 3 show that the soils of the Esperance area are suitable for widespread planting of Maritime pine. Approximately 230,000 hectares out of a cleared area of nearly one million hectares is highly suitable for growing Maritime pine, including the sandier soils where the agricultural returns are historically marginal.

The Esperance region includes Lake Warden (see Figure 1), which is recognised as a wetland of international importance listed under the Ramsar Convention. As such, it requires special protection to ensure its special ecological values are maintained or improved. The Lake Warden catchment is at great risk of salinity, but research of salinity management options for the area shows that widespread planting of trees can have a significant impact on reducing catchment recharge. (*Assessment of Salinity Management Options for Lake Warden catchments, Esperance, WA: Groundwater and Crop Water Balance Modelling, CSIRO & Department of Agriculture WA December 2000*)

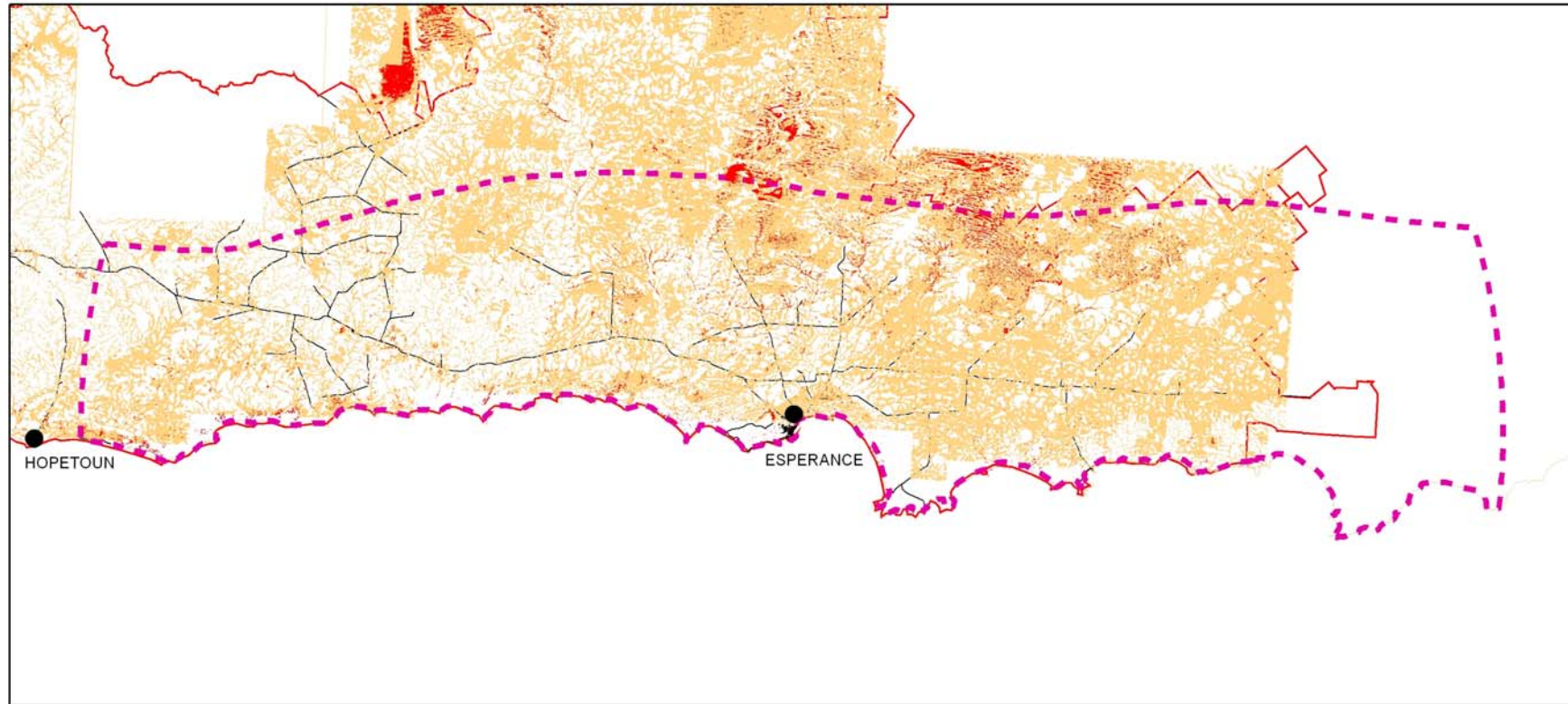
Other near coastal lakes fed from cleared land, such as Lake Gore, immediately to the west of the Lake Warden catchment, have similar conservation challenges and treatment options.

Extensive tree planting integrated with agriculture, when combined with other measures such as perennial pastures and drainage, provides a real option to reducing salinity and waterlogging threats in this region.



# TREE FARMING & INDUSTRY DEVELOPMENT PLAN

## MARITIME PINE - ESPERANCE



**FIGURE 2: SALINITY RISK\***

-  SALINE
-  AT RISK OF BECOMING SALINE



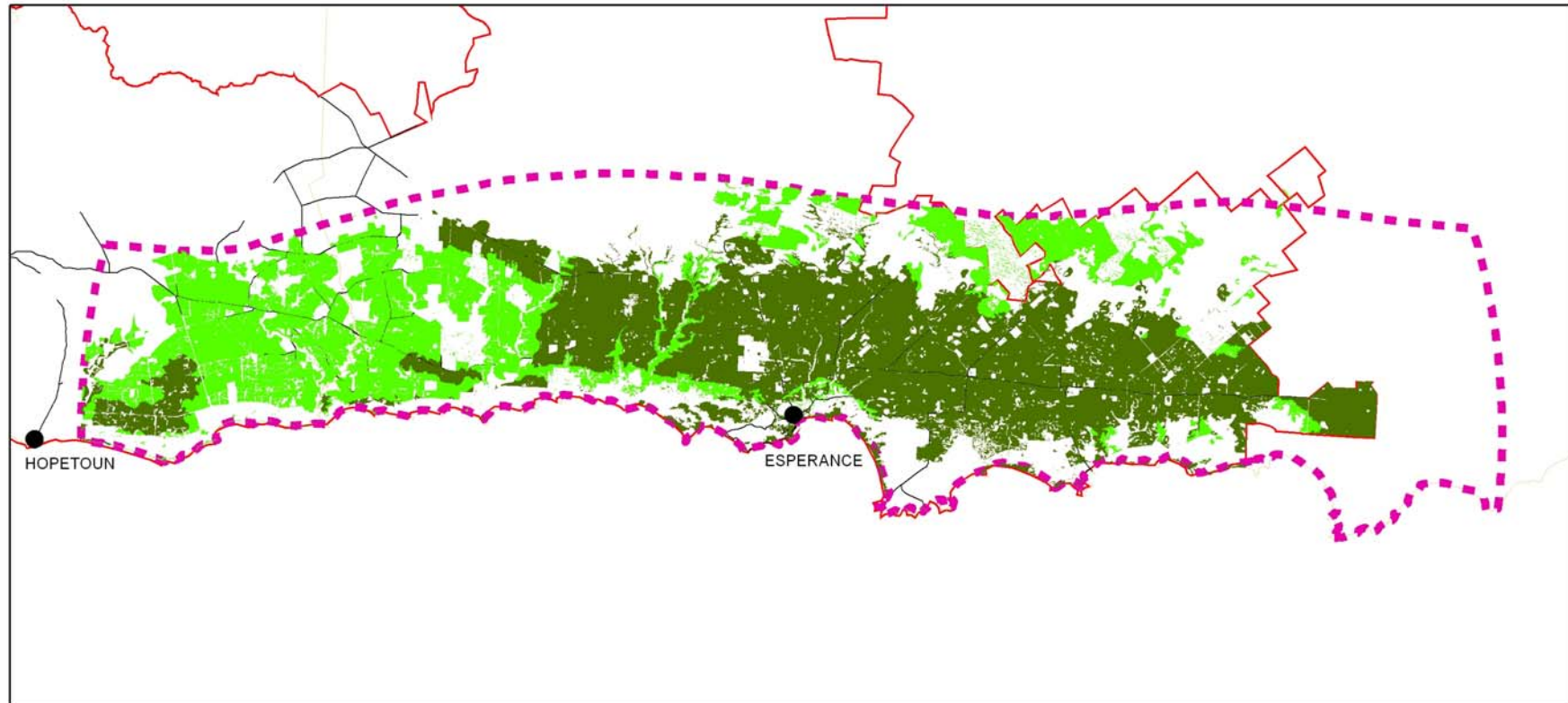
\* SALINITY RISK FROM CALM LAND MONITOR MODELLING

0 25 50 100km



MAY 2005

# TREE FARMING & INDUSTRY DEVELOPMENT PLAN

## MARITIME PINE - ESPERANCE



**FIGURE 3: CONCENTRATION OF CLEARED LAND SUITABLE FOR MARITIME PINE**

-  HIGH CONCENTRATION OF SUITABLE SOILS ON CLEARED LAND
-  MEDIUM CONCENTRATION OF SUITABLE SOILS ON CLEARED LAND

SOIL LANDSCAPE INTERPRETATION PROVIDED  
BY AGRICULTURE WA & FPC



0 25 50 100km

MAY 2005

## The Opportunity

### Market & Industry Opportunities

The expanding global and regional market for wood fibre creates an opportunity to make the growing, harvesting and processing of forest products a substantial part of the local economy while also improving the sustainability of agriculture within the Esperance region.

Global and regional demand for wood products is increasing as population and living standards increase. China has become a major trading partner with Australia, and is a vigorous consumer of wood products. There is also increasing pressure against harvesting of native forests worldwide, which presents opportunities for more plantations.

World energy prices are increasing, which gives energy-efficient wood products a competitive edge. The capacity for trees to sequester atmospheric carbon also provides the opportunity for new plantings to offset the greenhouse impact from burning fossil fuels.

The availability of large areas of farm land in need of trees, combined with a stable political and economic environment, should encourage investment in a competitive forest products industry.

Maritime pine is widely used in western Europe for sawn timber, peeling, panel boards (such as plywood) and pulp. Market research suggests there is potential for the development of a number of Maritime pine based industries in the Esperance region.

There are a number of scenarios that could be implemented to supply a range of integrated industries, either separately or jointly for local manufacturing. These may include a veneer or plywood plant, or a panel board manufacturer, which have the potential to be supplied from the target of 70 000 to 125 000ha of trees on farms.



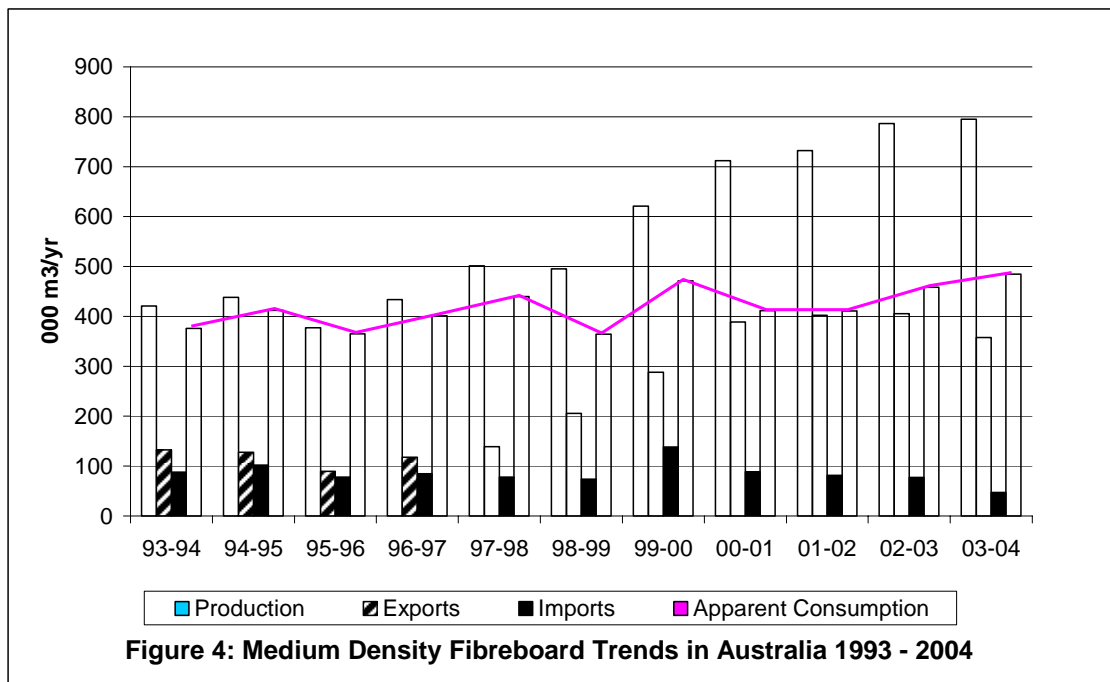
These industries could also support local manufacture of other products from the primary product, increasing the economic benefit to WA. Complementary industries such as power generation using plantation and processing residues are other potential options.

Following considerable research and evaluation, Maritime pine is being used to produce high quality laminated veneer lumber (LVL) products in Western Australia.

LVL consumption in developed countries grew substantially during the 1990s and into the new century as substitutes for structural hardwoods and large dimension softwoods that became more expensive or less available because of environmental concerns.

Maritime pine has comparable strength to some traditionally used hardwoods, the supply of which is declining. An LVL plant could produce dried veneer or laminated beams as well as manufactured products such as I-beams, all of which have a strong demand outlook. Although the market for LVL is competitive, growth in demand is expected to continue, particularly in the developing countries within our region, which could provide opportunities for new projects.

The Maritime pine plantations north of Perth provide the main feedstock for producing medium density fibreboard (MDF) and now LVL. The Australian consumption and export of MDF has been rising strongly, and this trend is expected to continue as MDF continues to replace solid wood products.



The establishment of a Maritime pine plywood or veneer mill could fill a gap for a softwood processing plant in the southern hemisphere and provide the Esperance region with a unique market opportunity. The demand outlook for plywood as a building product, particularly formwork in construction, is promising.

The demand from Asia for pine logs could be a potential outlet for thinnings from Maritime pine plantations until panel board or other manufacturing options can be established<sup>1</sup>.

The demand from Asian pulp and paper mills is expected to continue. It is likely that woodchipping facilities will be required to export Tasmanian bluegum woodchips, and it would be possible to export pine woodchips using these same facilities.

Timber from species other than Maritime pine could also complement timber supplies from the Goldfields. These Goldfields timbers are being used for high-value end uses such as inlays in fine wood furniture manufacture, and decorative building materials such as flooring and architraves.

<sup>1</sup> This has been occurring from the Bunbury port in recent years.

## Species

Following a review of growing patterns, wood properties and local conditions including soil, hydrology, evaporation and rainfall, several species have been identified as being suitable to achieve environmental, social and economic benefits in the Esperance region.

Of these species, Maritime pine has been chosen as the key or 'driver' species because it will grow well over a wide range of soil and rainfall conditions and can be integrated for Esperance farming. Tasmanian bluegum is expected to be planted on the more fertile soils and in the higher rainfall areas (i.e. exceeding 550 mm).



Maritime pine has been grown in State-owned plantations for many decades, and the WA grown product is world-class. Originally from mainly France and Portugal, Maritime pine is a robust species that can adapt to a range of conditions. Trials and research on the growing habits of Maritime pine since the 1920s have made the FPC one of the world's leading authorities on the growing of the species. Helms Arboretum at Esperance is one of the oldest in the State.

The region is also suitable for smaller plantings of a number of other 'support' species, which over time could provide further impetus for industry development. Sugar gum (*Eucalyptus cladocalyx*) is well suited to the environmental conditions of the region, and can be grown to produce pruned sawlogs in belts or blocks on the better soils and lower rainfall areas. Tasmanian bluegum grown for woodchips and Sydney bluegum (*Eucalyptus saligna*) for pruned sawlogs will require annual rainfall in excess of 550 mm to achieve economic growth rates over a full rotation.

WA sandalwood (*Santalum spicatum*) can be grown on a wide range of sites as a small area high value crop. Oil mallee (*Eucalyptus spp*) processing is being trialled to produce eucalyptus oil, activated carbon and energy. Flat-topped yate (*Eucalyptus occidentalis*) is still in the early stages of assessment, though initial trials indicate that the species is suitable for moderately saline areas.

## Future Processing and Planting Options

### Primary Product

By planting at least 2000 ha of Maritime pine per year for 35 years, the following downstream processing opportunities become possible:

Processing type	Current sizes		Future sizes* (2030)			Future hectares required**
	Input (000 m <sup>3</sup> )	Output (000 m <sup>3</sup> )	Input (000 m <sup>3</sup> )	Output (000 m <sup>3</sup> )	Capital cost (\$AU million)	
LVL plant	160	90	350	200	150	70 000
Plywood mill	450	220	615	300	150	125 000
Sawmill	750	300	1000	500	130	200 000

\* Based on URS Forestry internal report 2003m and Wesbeam State Agreement. Capital costs are 2003 values.

\*\* The planting targets are estimates to achieve the critical mass for a local industry. If they cannot be met, product would have to be exported or processed in other parts of the State.

Planting at least 70 000 to 125 000 ha of Maritime pine over the 35 years is necessary to generate the critical mass required to stimulate downstream processing, in the form of LVL or plywood manufacture processing, and create jobs<sup>2</sup>. It would also stimulate the scale of planting necessary to address the threat from rising water tables.

For the FPC to focus its tree farming effort in the Esperance region towards this goal, there will need to be substantial local support.

### Thinning and Residue Product

An MDF plant could begin production well before the full rotation is harvested.<sup>3</sup> Log exports could commence with early thinnings prior to the establishment of an MDF plant and could generate significant employment. Such a plant could also use the processing residues from log peeling or sawing activities.



<sup>2</sup> A plant is predicted to need at least double the intake of Wesbeam's Perth plant to be competitive in 2030.

<sup>3</sup> The Maritime pine MDF plant in Perth started production well over 10 years ahead of the LVL plant and the Radiata pine particleboard plant in Bunbury was in production nearly 20 years before the rate of pine sawmilling escalated substantially.

## Employment

Expanding tree farming in the Esperance region has the potential to provide a major stimulus to employment opportunities in the area.

A planting target of either 2000 or 3500 ha per year for 35 years to achieve a critical mass of 70 000 or 125 000 ha has the potential to create over one thousand local jobs, depending on the extent of local processing and value adding.

### 70 000 ha of Maritime pine

Direct Employment	When	Jobs <sup>1</sup>
Planting, tending, maintaining and harvesting <sup>2</sup>	by yr 1	20
	by yr 20	60
	by yr 35	90
LVL Plant (350 000m <sup>3</sup> /yr log input)	by yr 35	200
Re-manufacturing & value adding	by yr 35	30
<b>Direct employment by yr 35</b>		<b>320</b>
<b>Indirect employment <sup>3</sup> by yr 35</b>		<b>800</b>
<b>Total employment by yr 35</b>		<b>1120</b>

### 125 000 ha of Maritime pine

Direct Employment	When	Jobs <sup>1</sup>
Planting, tending, maintaining and harvesting <sup>2</sup>	by yr 1	35
	by yr 20	100
	by yr 35	160
Plywood mill (615 000m <sup>3</sup> /yr log input)	by yr 35	250
<b>Direct employment by yr 35</b>		<b>410</b>
<b>Indirect employment<sup>3</sup> by yr 35</b>		<b>1025</b>
<b>Total employment by yr 35</b>		<b>1435</b>

<sup>1</sup> Jobs are full time equivalents. Direct employment figures based on BIS Shrapnel report.

<sup>2</sup> Employment in plantation activities rises steadily and plateaus when estate size is reached and harvesting and replanting are underway.

<sup>3</sup> Employment multiplier of 2.5

## Implementation

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

To implement this Plan, the FPC will work with the Esperance community to identify avenues to achieve target planting levels that 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 range 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 private sector companies.

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.

## Appendix 1 - Planting for the Future

### Planting Conditions

The soil and climate of the area are suitable for the growing of Maritime pine, which grow in sands and well drained soils of a minimum of 2.5 metres in depth and in areas of rainfall within the range of 400 to 700mm (see figure 3).

While this plan supports the planting of Maritime pine to stimulate downstream processing, species such as sugar gum which requires sandy loams to gravelly clay loams in a minimum soil depth of 3 m and rainfall in the range 380 mm to 650 mm, and Sandalwood, which can adapt to a wide range of soil types, can also be grown if there was interest to pursue these species in the future.

The region is also suitable for Tasmanian bluegum, which grow in sandy to gravelly clay loams a minimum of 2.5 m depth, but require rainfall in excess of 550 mm to achieve economic growth rates over a full rotation.

For most of the 20th century, the area around Esperance was considered too infertile for intense agriculture, but in 1949 it was discovered that the soil only needed additional trace elements to make it fertile. Since then, the region has turned into a successful producer of wheat, sheep and cattle, and in more recent years, tree farming.

A review of types and zoning has identified 202 000 ha<sup>4</sup> as being highly suitable and available for the growing of Maritime pine:

	Hectares	% of total
Total area	1 328 000	
Cleared	972 000	73
Remnant bush and plantations	356 000	27
Includes: Land highly suitable and available for Maritime pine	202 000*	15

*\* These areas are predominantly deep sands or sandy soils. However, Maritime pine will also grow well on loamy soils*

### Silviculture (forest management practices)

The planting regime for Maritime pine to achieve logs for sawing or peeling is to plant trees at 1500 stems per hectare in either blocks or wide belts. A portion of the crop may need to be pruned and all areas should be thinned two to three times during the rotation of approximately 35 years.

To grow eucalypts for sawlogs, trees are also planted in blocks or wide belts at a spacing that will maximise diameter growth while using stored soil water and rainfall over the rotation (20–25 years). Final stocking is achieved by thinning at age four to seven, and the trees are high pruned to yield a high quality log from the lower part of the tree. Pasture growth will support reasonable levels of stock during the early years.

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<sup>4</sup> Figure 3 shows 730,000 ha of the target area (55%) having either a high or medium concentration of cleared land suitable for Maritime pine. The estimate of suitable area of 202,000 ha takes into account the distribution of unsuitable soils as well as the greater likelihood that sandier soils will be preferred for trees.

## Appendix 2 - Setting the Scene

### Existing Planting

More than 17 000 ha\* of commercial trees have already been planted in both private and Forest Product Commission-managed plantings.

Species	FPC (ha)	Private (ha)
Tasmanian bluegum ( <i>E. globulus</i> )	3	14 640
Other eucalypt	95	
Maritime pine ( <i>P. pinaster</i> )	2204	
Radiata pine ( <i>P. radiata</i> )	53	
Other	15	
<b>Total</b>	<b>2370</b>	<b>14 640</b>

\* Sourced from CALM as of December 2004

Figure 5 shows the wide distribution of pine plantings in the region

The area already has plantations of Tasmania bluegum and there are plans for substantial expansion in the future. These plantations will supply an export chip market with the completion of a chip mill in the next few years.

The success of the FPC's Maritime pine plantings in the area, first established in 1992, has confirmed the region's suitability for the species. The FPC has also successfully planted and harvested Maritime pine near Perth and in other parts of the State for several decades, and has accumulated extensive scientific knowledge on its growing habits.

The significant amount of land that is suitable for growing Maritime pine in the Esperance region, and the ability of the species to have significant environmental benefits when planted in mass, provide the settings for developing a viable timber processing industry in the region.

# TREE FARMING & INDUSTRY DEVELOPMENT PLAN

## MARITIME PINE - ESPERANCE

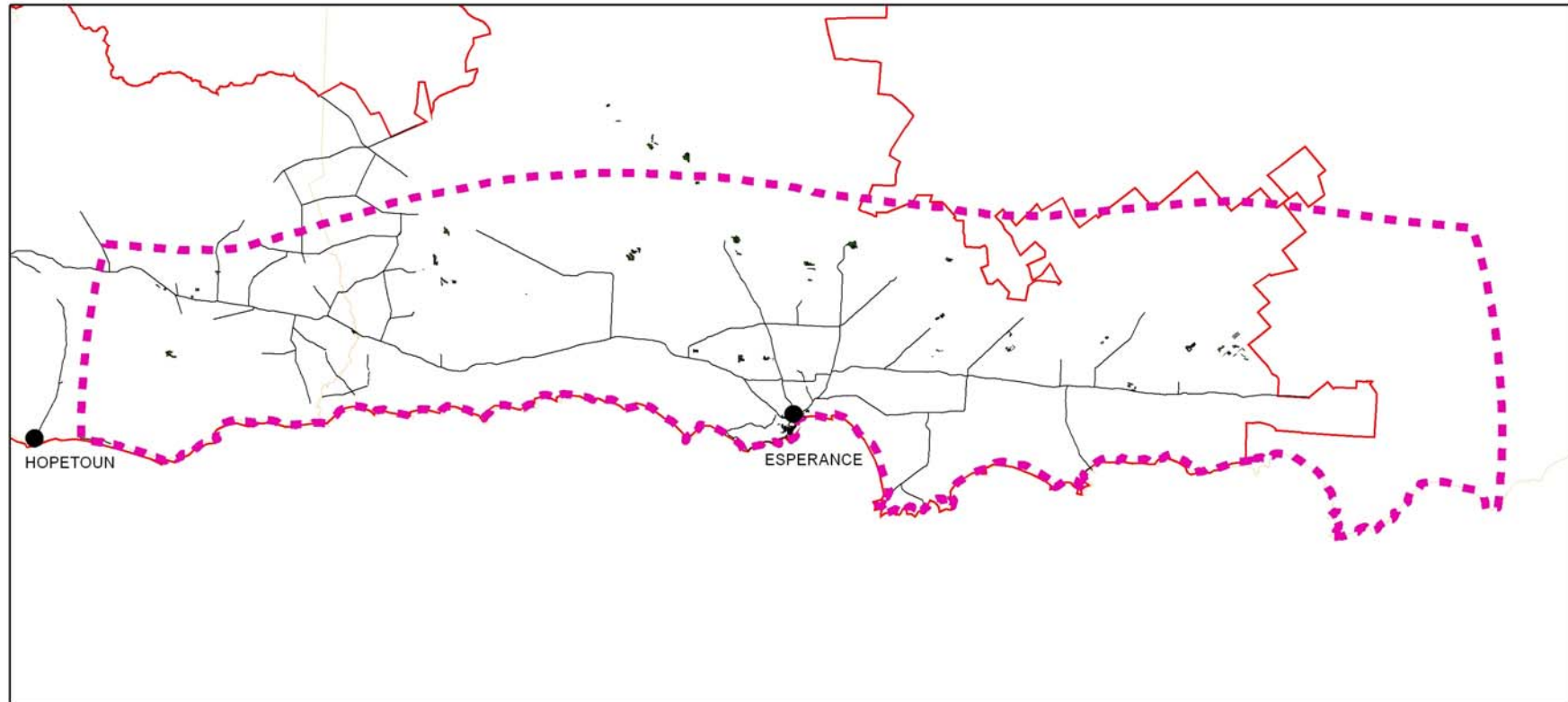



FIGURE 6: STATE PINE PLANTATIONS

 PINES



0 25 50 100km

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## Infrastructure

The town of Esperance is the major centre in the region and the administrative centre for the Shire of Esperance.

The Esperance region has a well established infrastructure base to support downstream processing of forest products, as outlined below:

**Power**            The Esperance main power supply changed from diesel power to gas power in March 2004 with the completion of the new gas pipeline from the North West Shelf. The addition of the 30 MW power station has significantly improved the capacity of the region to accommodate future industrial development.

**Water**            Availability of fresh water in the Esperance area is limited. Recent discussions have focussed on establishing a desalination plant in the Esperance area to supply water to Kalgoorlie and to meet local needs. This is now possible due to the opening of the gas fired power station.

**Rail**                There is a goods rail connection between Kalgoorlie and Esperance, which is used mostly to transport mining products (from Kalgoorlie) and agricultural products (mostly grain) to the Esperance port.

**Roads**            The road system around Esperance is excellent. The roads are predominantly gravel but are generally straight and wide, and laid out in an industrial grid pattern to service the local agricultural industry.

**Port**                Port facilities are available through Esperance with good rail connections. There are no container facilities at present.