Djarlma Plan for the Western Australian Forestry Industry

A FRAMEWORK FOR ACTION 2019–2030

FIFWA
FOREST INDUSTRIES FEDERATION (WA) Inc.

Forest Products Commission
WESTERN AUSTRALIA

Why Djarlma?

Forestry is changing... to meet the challenge of climate change and to revitalise a sustainable industry.

The Djarlma Plan is inspired by the Noongar concept of Djarlma, which reflects the interconnected relationship of people with forests and woodlands.

"When the great Waugal created the boodja (land), he ensured that there were wirrin or spirits to look after the land and all that it encompassed. Some places, such as the kaart (hills) and ngamar (waterholes), boya (rocks), bilya (rivers) and boorn (trees) were created as sacred sites and hold wirrin, both warra (bad) and kwop (good). Noongar believe that the spirits of their ancestors live in the forests. The ancestral spirits of their demanggar (grandparents) are there to give them their healing and their food.

Everything in Noongar boodja has a purpose; if the forests are not preserved and maintained then they will have no ancestral spirits to guide them and give them sustenance and healing, the forest spirits will go to sleep forever and Noongar will become sick in both mind and body.

Djarlma is about looking after wirrin, which ensures the spiritual health of the forests. For Noongar, the spirit is in the forest, the forest is a place of worship, the Mother place (wirrin / ngaank).

The forest is not simply an asset but is life. Noongar identity and connection is drawn from the land (kadjan / kanya) and their totems dictate a holistic responsibility for animals, trees and places (borunga). The trees in the forest cannot be considered separately to their spiritual ecosystem."

Courtesy of the South West Aboriginal Land and Sea Council and extended by Senior Noongar custodians

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CONTENTS

ABOUT THIS PLAN

The forestry industry recognises it has an opportunity to support transformative change towards a more sustainable future for Western Australia. To seize this opportunity, the Djarlma Plan provides a **strategic framework** to achieve long-term regional economic well-being, employment, and investment to foster ecologically sustainable development and to provide social and environmental benefits.

The Djarlma Plan will be supported by an implementation plan to be developed through a consultative process.

FOREWORD

The Djarlma Plan sets out the strategic directions for the entire Western Australian forestry industry, including the private sector and the Forest Products Commission. It encourages collaboration within and between government agencies, within and between private sector organisations, and between the government and the private sector in support of whole of government aims.

Hon Dave Kelly MLA
Minister for Water; Fisheries; Forestry; Innovation and ICT; Science

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EXECUTIVE SUMMARY

Scientific management of Western Australia's forests was introduced 100 years ago with the establishment of the Forests Act 1918. Since then, many things have changed.

Environmental challenges, such as invasive plant and animal species, threaten the diversity and stability of Western Australian forests, woodlands and plantations. In addition, climate change is an emerging key pressure.

The Western Australian forestry industry also faces social and economic pressures. The perception that forestry investments are less secure than alternative investment opportunities has contributed to lost opportunities for job creation, and insufficient innovation in research, technology, the workforce, forest products and markets.

The forestry industry recognises it has an opportunity to support transformative change towards a more sustainable future by maintaining healthy forests, supporting regional employment and growth, and helping to mitigate climate change. To seize this opportunity, the Djarlma Plan provides a strategic framework to achieve long-term regional economic well-being, employment, and investment to foster ecologically sustainable development and to provide social and environmental benefits.

The Djarlma Plan is inspired by the Noongar concept of Djarlma, which reflects the interconnected relationship of people with forests and woodlands. The Plan encourages collaboration within and between government agencies, within and between private sector organisations, and between the government and the private sector in support of whole of government aims.

The Djarlma Plan consists of four interdependent strategic priorities that aim to integrate traditional with scientific knowledge. Together, they provide a guide for the Western Australian forestry industry to allow it to maximise its contribution to the social, economic and environmental well-being of the state by promoting forests for future generations and maintaining a vibrant and profitable industry. These priorities are:

- **Healthy forests and woodlands** – Healthy forests and woodlands underpin the future of the Western Australian forestry industry.
- **Wood product and ecosystem values** – The industry of the future provides the full range of forest and woodland values in support of a sustainable low carbon future.
- **Community benefits** – The community supports, values and benefits from forests and woodlands.
- **Industry for the future** – A technologically-led, competitive, collaborative industry.

The implementation of the Djarlma Plan uses a holistic approach, engaging communities and using traditional knowledge, as well as scientific evidence, to achieve new thinking and better outcomes for the forestry industry. The Plan also supports and is consistent with state, national and international environmental initiatives.

Within six months of the delivery of the Djarlma Plan the Forest Products Commission and Forest Industries Federation of Western Australia will have completed a consultative process and delivered the Djarlma Implementation Plan. The system will be transparent, and report annually to the government and the industry on progress while delivering the Plan. A Communications Strategy will also be developed to promote the values of forests and woodlands, the need for more plantations and farm forests to meet growing demand, and the importance of ecologically sustainable forest management.

The Forest Products Commission and the industry welcome the opportunity to collaborate with the community, businesses and government to deliver the Djarlma Plan.

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PREFACE

The Djarlma Plan for the Western Australian Forestry Industry was developed under the guidance of an independent panel comprising Dr Lyndall Bull, Ross Holt, Oral McGuire, Dr Chrissy Sharp and Ian Telfer. This diverse panel has worked together to identify key strategies and actions required to revitalise the Western Australian forestry industry.

The Djarlma Plan was inspired by the Noongar concept of Djarlma, which reflects the interconnected relationship of people, forests and woodlands.

In developing the Djarlma Plan, the panel sought feedback from a wide range of stakeholders through one-on-one and group interviews and via an online survey. The consultation process provided valuable information that was used to refine the Djarlma Plan's outcomes.

The Djarlma Plan identifies a strategic framework that refocuses the entire forestry industry to be smarter by working in a more collaborative way. It will generate rural employment and regional economic activity whilst ensuring forest, plantation and woodland health. The industry will support new and emerging technologies that encourage the sustainable use of timber and other forest values that help us to address global challenges such as climate change.

Dr Lyndall Bull
Chair,
Western Australia Timber Industry Development Reference Panel

A WORD FROM THE FPC AND FIFWA

The Forest Products Commission and Forest Industries Federation of Western Australia (FIFWA) welcome the Djarlma Plan and are committed to working with the forestry industry to take full advantage of opportunities to implement the Plan to achieve long-term social, economic and environmental benefits.

Stuart West
General Manager,
Forest Products Commission

Matt Granger
A/Chief Executive,
Forest Industries Federation of WA

PRINCIPLES OF THE DJARLMA PLAN

The implementation of the Djarlma Plan will be informed by the following principles:

- The Djarlma Plan supports the United Nation's **Sustainable Development Goals** – a global call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity.[1]
- Forest management occurs within the policies of the **Forest Management Plan 2014–2023**, which emphasises the continued protection of all old growth forest, and measures for protection of biodiversity and threatened species.
- The **community is engaged** in decisions that affect them to achieve better outcomes through collective action and shared responsibility. Culture, knowledge, practices, values, views and rights of the community and Aboriginal people are respected.
- Decisions are based on **scientific evidence, traditional knowledge** and the precautionary principle. Decision-making processes are consistent, fair, transparent and efficient. Regular monitoring and transparent reporting enable evaluation of forestry industry activities and outcomes.
- The approach to conservation and ecologically sustainable management of forests taken in the Plan is both **holistic**, in that it integrates environmental, social and economic values, and **adaptive**, to reflect the constant change in living systems. Today the rate of change is increasing because climate change is creating additional pressure on species, habitats, ecological processes and productivity.
- **New thinking and innovation** are required to maximise the value of wood fibre, to reduce waste and to assist the transition to a low-carbon economy.
- The Djarlma Plan supports and is consistent with Australian Government initiatives including the national forest industries plan 'Growing a better Australia – a billion trees for jobs and growth'.

[1] www.undp.org/content/undp/en/home/sustainable-development-goals.html

CHALLENGES AND OPPORTUNITIES FOR THE FORESTRY INDUSTRY IN WESTERN AUSTRALIA

Scientific management of Western Australia's forests was introduced 100 years ago with the establishment of the Forests Act 1918. Since then, many things have changed, and the Djarlma Plan provides a timely response to current challenges and positions of the Western Australian forestry industry to take advantage of the substantial opportunities that now exist.

ENVIRONMENTAL CHALLENGES

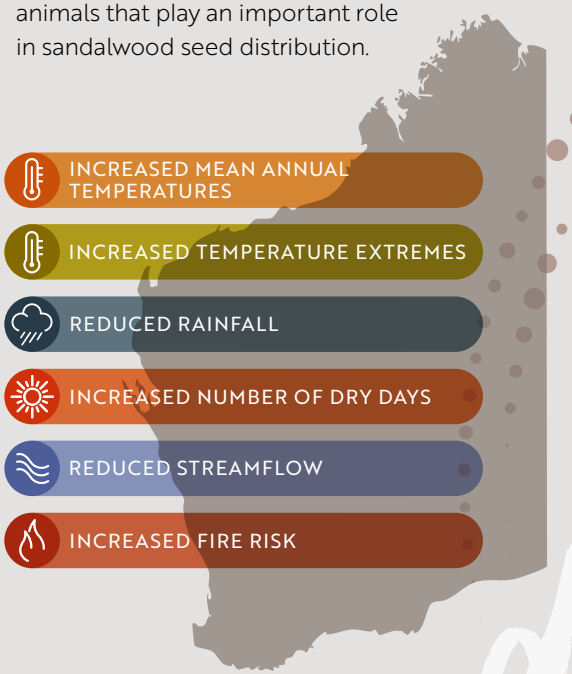
Pressures affecting Western Australia's forest and woodland habitats and species include invasive plant and animal species, such as cats and foxes, insect and disease outbreaks, and changes to fire regimes and the water cycle. Forest and woodland health is also affected by historical changes such as past forest use, and land clearing and fragmentation, whose influences persist.

Climate change is emerging as a key pressure on Western Australian forests and woodlands. Climate change directly increases temperatures and changes rainfall patterns, and it also amplifies and compounds other threats, such as bushfires. (Jackson, et al., 2017).

A combination of climate change, bushfires and a legacy of past forest and fire management practices has created a challenging situation for jarrah-marri forests and their associated surface and groundwater systems. Recent studies indicate that some of the forests of the South West region are already experiencing acute water stress because of falling groundwater tables.

Drought conditions in the Mid West have resulted in the failure of many pine plantations that were established in the early 2000s.

Sandalwood stands in the Wheatbelt and rangelands have a legacy of past overharvesting, overgrazing and the localised extinction of animals that play an important role in sandalwood seed distribution.



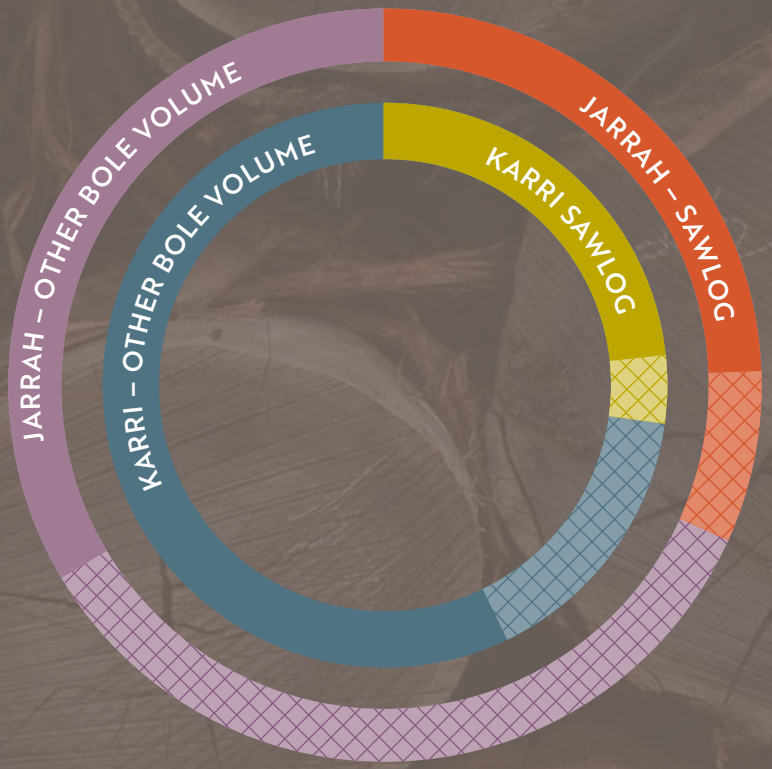
FORESTRY INDUSTRY CHALLENGES

The forestry industry provides substantial economic value to Western Australia, especially to regional communities in the South West where employment in the industry is highest. However, the ability of the forestry industry to contribute more to social and economic well-being is being undermined by uncertainty about the future of the industry.

The perception that forestry investments are less secure than alternative investment opportunities has contributed to lost opportunities for job creation; reluctance of investors, private land holders and government to invest in forests and the industry; and insufficient innovation in research, technology, the workforce, forest products and markets. Some of the key challenges facing the forestry industry are:

- **Policy** – The need for clear government policies on climate change and carbon pricing as well as changes to forestry policies have contributed to investment uncertainty.
- **Social licence** – Community trust in the forestry industry is affected by a range of factors including views about how forests and woodlands are managed, a legacy of failed plantation investment schemes and local issues such as the impact of forestry operations on road safety, bushfires and recreational and amenity values. The industry recognises that these concerns need to be addressed.
- **Security of supply** – The growth of the plantation estate has not kept pace with the increasing demand for timber and other forest products. The forestry industry requires long-term investment and security of resource supply.
- **Research, innovation and technology** – The research into, and adoption of, innovative forestry and forest product technologies has not kept pace with opportunities to develop new markets for sustainable, renewable products. In some areas of the state poor internet connection limits the adoption of web-based technology.
- **Markets** – The lack of support for products from ecological thinning, combined with weak investment in the development and marketing of innovative forest products, has limited the ability of the industry to tap into consumer demand for products that are based on renewable resources.
- **Workforce** – The industry is keen to attract people into jobs. However, opportunities for training are insufficient, and whilst the industry has embraced technology, the perception of some is that employment opportunities are based on difficult outdoors work.

Three year average production volumes compared to the FMP 2014-23 sustained yield limits



Jarrah – SawLog*
Veneer
Joinery
Roof Frames
Flooring and Decking
Furniture

Karri – Sawlog*
Veneer
Joinery
Roof Frames
Flooring and Decking
Furniture

Jarrah – Other Bole**
Volume
Paper
Firewood
Charcoal
Mulch
Silicon
Energy

Karri – Other Bole**
Volume
Paper
Mulch
Energy

- Jarrah – Sawlog: available volume not accessed
- Karri – Sawlog: available volume not accessed
- Karri – Other Bole Volume: available volume not accessed
- Jarrah – Other Bole Volume: available volume not accessed

* Sawlog - High-grade timber with a minimum length and diameter available under the Forest Management Plan 2014-2023.

** Other Bole Volume - All non-sawlog material available under the Forest Management Plan 2014-2023.

FORESTRY INDUSTRY OPPORTUNITIES

The Djarlma Plan aims to address forestry industry challenges and to seize opportunities for the forestry industry to play a stronger role in ensuring Western Australia's forests, woodlands and plantations are healthy, providing a range of renewable resources and able to provide community benefits, now and for future generations. Opportunities that the industry can take advantage of include:

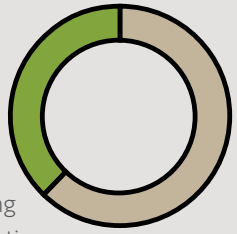
- Active management, through ecological thinning of regrowth forests to maintain their health in the face of climate change, applying nature-based solutions.
- The strategic development and adoption of long-term reliable policy settings presents the forestry industry with an opportunity to better support the work and policies of the Department of Biodiversity, Conservation and Attractions, other relevant government departments and local governments.
- Increasing the area of plantation estate can play a key role in carbon sequestration, local land remediation and provide long-term renewable resources.
- Increasing the area of plantation estate to grow and secure jobs and investment growth.
- Securing and maintaining social licence by more effectively listening and responding to concerns and suggestions, and by communicating and collaborating with communities to overcome any misgivings about the environmental and social impacts of forest management practices.
- Investment in research will assist the industry to work with scientists and ensure forest management decisions are based on sound knowledge.
- Research into, and adoption of, new and emerging technologies offer opportunities to reduce waste and generate higher economic returns from wood fibre.
- Aboriginal-led engagement in the forestry industry, including through the application of Traditional Knowledge, employment and the development of Aboriginal forest enterprises.
- Development of both domestic and international markets for innovative uses of wood and wood fibre, including engineered wood products that replace more energy-intensive products such as steel, aluminium and concrete, can reduce our reliance on plastics and fossil fuels.
- The creation of new markets for other bole volume is an opportunity to enable ecological thinning of jarrah-marri forests which will, in turn, help achieve healthier forests, generate economic returns and reduce waste.
- Most importantly, the forestry industry is well positioned to play an innovative role in the transition to a low-carbon economy, where forests, woodlands and plantations sustainably produce materials and energy as an alternative to carbon and energy-intensive products.

WESTERN AUSTRALIAN FORESTRY – RESOURCES

NATIVE FORESTS

Approximately 2.25 million ha of native forest is public land in South West Western Australia.

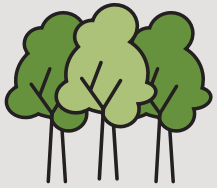
PUBLIC



38%
Sustainably managed as multiple use forest including timber production

62%
Set aside for conservation

All old growth is protected



The three most economically important species in Western Australia's native forests

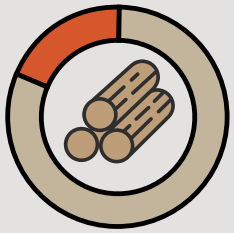
1 Jarrah 2 Karri 3 Marri

PLANTATIONS

There are around 360,000 ha of plantations in Western Australia.

Western Australia has an estimated 80,000 ha of softwood (pine) plantations.

Private property

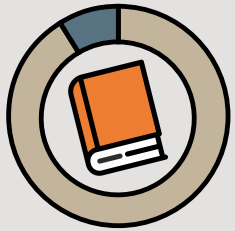


State forests & timber reserves

Most softwood plantations are managed for sawn timber.

Hardwood plantations cover an estimated **276,400 ha**:

9%
Other eucalypts



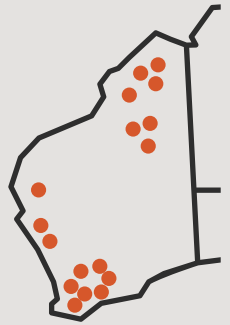
91%
Blue gum

Much of the hardwood plantation estate is on private land. Most hardwood plantations are managed for pulp logs.

SANDALWOOD AND OIL MALLEES

Native sandalwood occurs naturally in the southern half of the state in goldfields and rangelands.

Indian sandalwood has been planted in the Kimberley region.



Based on two markets ...

DOMESTIC

Perfumery, cosmetics and pharmaceuticals

EXPORT

Processed wood blend for the agarbatti market (incense)

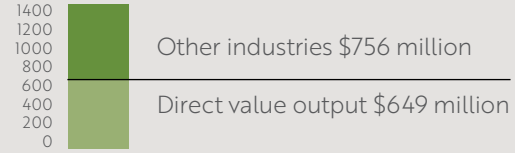
More than 14,000 ha of oil mallees have been planted in the Wheatbelt to develop an industry producing eucalyptus oil and biomass.

WESTERN AUSTRALIAN FORESTRY – ECONOMICS AND MANAGEMENT

FORESTRY INDUSTRY & ECONOMY

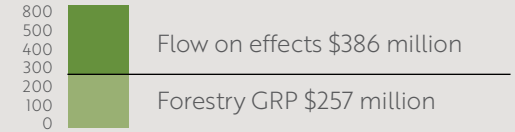
Value of industry output in 2015–2016

Total $1,405 million



Contribution to gross regional product (GRP)

Total $643 million



EMPLOYS 6,000 PEOPLE

- Forest growing
- Harvesting and haulage
- Sawmilling and processing
- Manufacture & merchandising
- Wood panel/ board production

OTHER BENEFITS

- Tourism
- Recreation
- Beekeeping
- Fresh water
- Carbon storage
- General health

MANAGEMENT OF PUBLIC FOREST LAND

The **Department of Biodiversity, Conservation & Attractions** is responsible for:

- National parks
- State forests and reserves
- Marine parks
- Protecting native animals and plants

The **Forest Products Commission** works as an independent commercial body to sustainably manage and develop Western Australian forestry.

Their three strategic objectives are to:

1. Provide healthy forests for future generations.
2. Create a vibrant industry for social and economic benefits, particularly in regional Western Australia.
3. Ensure efficient, effective and safe delivery of business outcomes.

Three year average of FPC financial highlights:***

- $11.3 million operating profit
- $2.2 million dividend to State government
- $9 million investment in new pine plantations
- $86.7 million regional expenditure
- $2.8 million tax and GST payments

*** These averages reflect figures from the 2016, 2017 and 2018 financial years.

MANAGEMENT OF PRIVATE FOREST LAND

Most **hardwood plantations** are owned and managed by private sector companies.
These include:

- Pulp and paper companies
- Plantation managers in both processing and export

Farm forestry holdings represent a minor part of forestry supply. Hardwood plantations for sawlogs are owned by a group of small holdings.

330,000 ha
of privately-owned native forest that could be sustainably managed for forestry.

Softwood plantations are largely owned by government.

Current private softwood resources are estimated to be at least 3,000 ha and until recently were declining in area.

WESTERN AUSTRALIAN FORESTRY – CERTIFICATION AND PLANNING

FOREST CERTIFICATION

Many activities and processes of the forestry industry are independently and internationally certified:

AS4708:2013
Responsible Wood (Australian Forestry Standard) Internationally recognised by the Program for the Endorsement of Forestry Certification (PEFC).

ISO14001:2004
Environmental Management System
The international standard for environmental management systems.

Forest Stewardship Council
Ensures that forest products are sourced from forests that are managed responsibly.

Independent external audits are undertaken to assess the conformance of the management systems of the FPC against both the AS/NZS ISO 14001 and the Australian Forestry Standard.

Sandalwood harvested by the Forest Products Commission from native woodland is subject to a rigorous, independent environmental certification process under the Environmental Management Systems (EMS ISO 14001)

FIRE MANAGEMENT

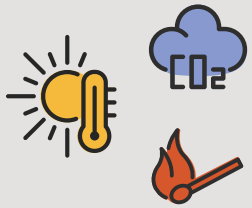
Fire management is an important factor playing a role in:

Recycling nutrients

Mitigating diseases

Maintaining biodiversity

Increasing bushfires and their impacts on community are largely due to drying climate and build-up of fuels.



Bushfire management is a shared responsibility between:

- Department of Biodiversity, Conservation and Attractions
- Department of Fire and Emergency Services
- Local government
- Volunteer fire brigades
- Forest Products Commission
- Forestry industry

FOREST MANAGEMENT

The forestry industry is governed by:

Conservation and Land Management	Act 1984
Regional Forest Agreement	South-West Forest WA
Commonwealth Environment Protection and Biodiversity Conservation	Act 1999
Biodiversity Conservation	Act 2016

Western Australia's Forest Management Plan 2014-2023 key goals:

1. Conserve biodiversity of native species
2. Recovery of biodiversity from disturbance operations
3. Adapt to climate change and sustain global carbon cycles
4. Sustain ecosystems and plantations through changing climate conditions
5. Protect and maintain Noongar and other cultural heritage
6. Social and economic benefits via a range of goods/services for the community
7. Management that is systematic and continually improved

STRATEGIC OUTCOMES OF THE DJARLMA PLAN

The Djarlma Plan sets out four interdependent strategic priorities the Western Australian forestry industry will follow to maximise its contribution to the social, economic and environmental well-being of the state by promoting forests for future generations and maintaining a vibrant and profitable industry. All four strategic priorities aim to integrate traditional knowledge with scientific knowledge.

REVITALISING THE WESTERN AUSTRALIAN FORESTRY INDUSTRY

HEALTHY FORESTS AND WOODLANDS

Outcome: Healthy forests and woodlands underpin the future of the Western Australian forestry industry

The long-term success of the forestry industry depends on Western Australia's forests, woodlands, plantations and farm forests being maintained in a healthy condition. The forestry industry is committed to improving and sustaining the health and long-term productivity of Western Australia's forests, woodlands and plantations through ecologically sustainable forest management.

The forestry industry will collaborate with Aboriginal people, government, researchers and private land managers so that knowledge informs changes to forest operations and use. It will seek to develop markets for products generated through ecological thinning so that such restoration activities are affordable for the state, as well as being environmentally and socially sound.

To achieve the strategic outcome, **healthy forests and woodlands underpin the future of the Western Australian forestry industry**, we will pursue the following enabling strategies:

1. Apply best forest management practices by:
   - Adapting silviculture to improve forest health and restore forest and catchment resilience, in line with government direction
   - Collaborating in the prevention and management of harmful forest fires
   - Promoting independent, internationally recognised certification of forest and timber production[2]
2. Support Aboriginal people to manage forests and woodlands for spiritual and ecological values, including by promoting an understanding of Djarlma as a concept for the holistic and spiritual management of forests and woodlands
3. Collaborate with researchers and Aboriginal communities, including through industry-wide support for research, to better understand the threats to forest health and to identify opportunities to adapt forestry operations

[2] Commonwealth of Australia, 2016.

Examples of activities that support **healthy forests and woodlands** include:

- Support research on the likely impacts of climate change on the resilience of Western Australia's forests, woodlands, plantations and farm forests to improve policy development and decision making on management practices
- Undertake ecological thinning of smaller trees in imbalanced jarrah-marri regrowth forests, as required by the Forest Management Plan, and use operational trials to demonstrate improved forest health and resilience
- Support the development of local markets for ecological thinning and harvesting residues, including for bioenergy where wood fibre is unsuitable for higher value uses, to improve efficiency of resource use
- Assist the Department of Biodiversity, Conservation and Attractions to develop a regulatory framework for mechanical fuel reduction
- Continue research into commercial tree species to improve productivity in a drying climate
- Expand the regeneration of sandalwood and manage the extraction of wild sandalwood within the draft Biodiversity Management Program
- Aboriginal people to lead the development of Djarlma Standards, aligned with internationally recognised certification scheme standards, to benchmark the forestry industry against cultural values
- Investigate the use of new and emerging technologies in aerial imaging and drones to improve harvest planning and review success of regeneration

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REVITALISING THE WESTERN AUSTRALIAN FORESTRY INDUSTRY

WOOD PRODUCTS AND ECOSYSTEM VALUES

Outcome: The industry of the future provides the full range of forest and woodland values in support of a sustainable low-carbon future

Forests and woodlands are part of the identity of Western Australia. They provide timber, water, recreational opportunities, spiritual and amenity values, and they store carbon, which helps us mitigate climate change.

The forestry industry will work with stakeholders, to recognise, and sustainably provide, the full range of socio-economic and environmental values from forests and woodlands. The industry fully supports the opportunity that forests and woodlands offer to integrate Aboriginal cultural and scientific knowledge into the life of all Western Australians.

To meet the growing demand for wood products and other forest values, the Djarlma Plan calls for an expansion of both plantations and farm forestry (see the strategic priority Industry for The Future).

Most importantly, the forestry industry seeks to play a key role in addressing the global challenge of climate change. Forest products, including from plantations and farm forests, will help mitigate climate change by providing low-emission substitutes for materials that require larger amounts of fossil fuels to be produced, such as steel, aluminium and concrete.

The forestry industry recognises that its part in the transition to a low-carbon future requires bringing the community along with them, and more effective collaboration across government, the industry and the Noongar people to earn and maintain community support.

To achieve the strategic outcome, **the industry of the future provides the full range of forest and woodland values in support of a sustainable low-carbon future,** we will pursue the following enabling strategies:

1. Use natural capital accounting tools to build a shared understanding with different groups of all values provided by forests and woodlands
2. Support the transition to a low-carbon economy by encouraging the use of sustainably-produced wood-based products as substitutes for carbon intensive products
3. Promote improved regional economic and social benefits from forests and woodlands through the sustainable supply of the full range of socio-economic and environmental values from forests and woodlands

Examples of activities that support **wood products and ecosystem values** include:

- Develop, test and apply natural capital accounting tools for use by the industry
- Government to endorse and implement a wood encouragement policy and collaborate in the development of marketing campaigns to promote the use of locally-produced, sustainable forest products that store carbon and are energy efficient
- Undertake collaborative research into the use and sustainability of wood products and ecosystem services, and understand and recognise the role of carbon in native forest management
- Encourage new plantations and farm forestry projects to participate in the Carbon Farming Initiative
- Forest management strategies continue to support mechanisms to conserve biodiversity
- Actively promote improved regional, social and economic benefits from forests and woodlands (for example, timber, water supply, climate mitigation, recreational activities, bush produce, beekeeping, tourism and cultural purposes)

REVITALISING THE WESTERN AUSTRALIAN FORESTRY INDUSTRY

COMMUNITY BENEFITS

Outcome: The community supports, values and benefits from forests and woodlands

Both regional and urban communities benefit from forest and woodland values including biodiversity, cultural values, wood and water. They also benefit from employment and economic activity in the forestry industry, and forest-based tourism, recreational and beekeeping businesses. There are substantial opportunities to expand these benefits by supplying sustainable wood and other values that different groups expect from forests and woodlands.

We will work to build our social licence with Western Australians by listening, acting responsibly, acknowledging and addressing issues, and encouraging transparent communication between the forestry industry and the public.

To achieve the strategic outcome, **the community supports, values and benefits from forests and woodlands,** we will pursue the following enabling strategies:

1. Provide sustainable economic development and employment opportunities that contribute to a low-carbon economy
2. Create regular and ongoing forums to value and encourage the contribution of all stakeholder groups to the forestry industry – including by more effectively listening and responding to views and concerns, and by collaborating with stakeholders to realise shared environmental, social and economic objectives
3. Operate in a manner that supports safe communities, including promoting community fire safety and improving transport of forest products

Examples of activities that support **community benefits** include:

- Establish a Forest Products Commission stakeholder reference group that provides a diversity of stakeholder views, including the views of Aboriginal people, to the Commission
- Provide opportunities for community consultation to develop a shared understanding of how, when and why ecological thinning and other management activities should be undertaken
- Support and build the contribution that communities make to forests and woodlands by collaborating with community groups and supporting community engagement in forest-based activities, for example:
    - promoting community involvement in citizen science and conservation activities
    - supporting recreational groups to responsibly access forest areas
    - providing opportunities for people to connect with nature for their health and well-being
    - supporting Aboriginal people to maintain and grow cultural practices
- Provide resources for the Wellington Discovery Forest, directed by the Friends of the Wellington Discovery Forest

REVITALISING THE WESTERN AUSTRALIAN FORESTRY INDUSTRY

INDUSTRY FOR THE FUTURE

Outcome: A technologically-led, competitive, collaborative industry

By adopting new and emerging technologies the forestry industry has a tremendous opportunity to support regional and state economic, environmental and social values. It will do this by working in a collaborative manner to innovate in all steps of the supply chain, from forest management and plantation and farm forestry development, to the end use of forest goods and services.

By working smarter, the industry will sustainably supply forest values in a socially and environmentally responsible manner. The Australian Forest Industry Advisory Council notes that:

> ...the potential from new products is enormous. For example, carbon fibres derived from wood are used to make lightweight parts for motor vehicles and packaging for food and beverages; and solvents made from wood fibre are used instead of petroleum. Wood also has the potential to generate renewable energy through the combustion of wood pellets or liquid biofuels (Commonwealth of Australia, 2016).

To meet the growing demand for forest products there is a need to increase the area of plantation within Western Australia. In addition, although currently providing only a very small proportion of the state's forest products, there is potential to expand farm forestry.

There is also a need to develop and apply innovative technology along the entire value chain, from within the forest to the end use of products, to improve efficiency of resource use and reduce waste.

To achieve the strategic outcome, **a technologically-led, competitive, collaborative industry,** we will pursue the following enabling strategies:

1. Promote innovative, cost-effective forestry practices and value-added forest products that enable efficient use of renewable resources and support a transition to a low-carbon economy, using sustainable wood products as disruptive technologies
2. Secure investments in the forestry industry, and in the future supply of forest products, by supporting the considered expansion of the plantation estate (softwood, hardwood and sandalwood) and farm forestry
3. Collaborate with stakeholders to provide diverse, culturally safe and desirable workplaces and careers within the forestry industry

Examples of activities that support **industry for the future** include:

- Seek support for a forestry innovation hub in Western Australia
- Create opportunities for Aboriginal-led engagement and practices within the forestry industry, including by facilitating the development of Aboriginal forest enterprises
- Encourage the state government to establish investment security guarantees to underpin new investment in the native forestry industry in line with resource availability under the Forest Management Plan and industry strategic direction, and consistent with the principles set out in the Djarlma Plan
- Expand the area of plantation and farm forests, whilst ensuring the right trees in the right place at the right scale by:
  - supporting the ongoing implementation of the Softwood Industry Strategy for Western Australia
  - promoting well-planned farm forestry based on commercial scale planting, identified market needs, sound business models, and technical advice from qualified agriculture advisers and foresters
  - encouraging a transition to a mixed resource (natural woodland and plantation) in the sandalwood industry
- Establish a farm forestry section within the Forest Products Commission that supports the establishment of plantations and forestry on private land
- Ensure the continuation of programs such as Farm Forestry Assist to provide high-quality seedlings to farmers
- Promote collaboration between industry, farmers and the government to develop business models that support the expansion of forestry on farms
- Encourage industry to sustain market access for private growers through wood purchase agreements
- Explore ways for certification standards to provide greater value for smaller-scale operators
- Encourage strategic investment by both private and public sectors in new approaches, technologies and products that generate sustainable outcomes (for example, industry hubs, and integrated processing) that promote collaboration among businesses whilst improving innovation, long-term productivity, efficient resource use and business development outcomes
- Develop innovative products and new local markets for wood fibre from ecological thinning
- Improve utilisation and resource efficiency by reducing or eliminating wood fibre waste
- In the jarrah-marri regrowth forests, focus forestry operations on growing-on sawlogs for the future
- Develop a culture of innovation across all levels of the forest sector
- Implement a forest and timber industry workforce development strategy that promotes diverse and culturally safe work environments and a highly-skilled and motivated workforce

CASE STUDIES

ECOLOGICAL THINNING FOR HEALTH OF THE JARRAH-MARRI FOREST

In recent years both annual rainfall and stored groundwater levels have declined across much of the South West. This climate challenge has been compounded by past fire use and harvesting practices that have changed the structure of jarrah-marri forests from open forests of large trees to dense stands of regrowth.

Ecological thinning is a silvicultural treatment that involves reducing the number (density) of trees within a stand and leaves the strongest trees to grow on. This reduces competition for water, nutrients and light, and consequently, promotes growth and health of the remaining trees.

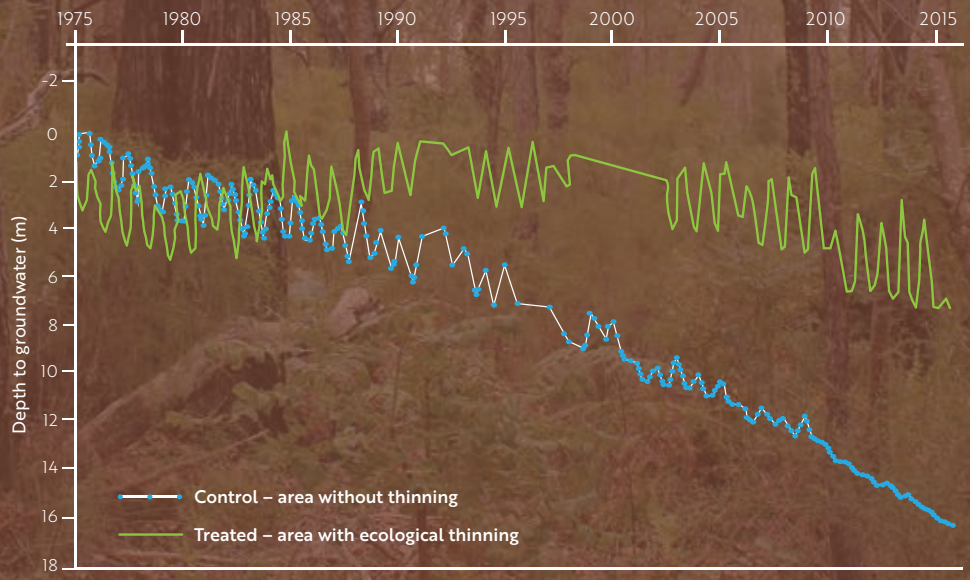
Scientific trials in jarrah-marri forests have found that ecological thinning of the forest generated increased streamflow and that thinning forest stands that are subject to water stress is vital to improving resilience.

Because thinning operations do not generally yield sawlog quality material, Western Australia is not undertaking ecological thinning operations, nor is the current rate of thinning, in conjunction with sawlog harvesting, sufficient to achieve silvicultural objectives that deliver ecological sustainable forest management.

Emerging markets for the "other bole volume" products generated by thinning operations would enable operations to be undertaken on a scale that would improve forest and catchment health and improve both surface and groundwater recharge.

ECOLOGICAL THINNING IN THE FOREST MANAGEMENT PLAN

In the Mid-term review of performance of the Forest Management Plan 2014-2023, the Conservation and Parks Commission proposes management responses relating to this lowering groundwater level and climate challenge. The Department of Biodiversity Conservation and Attractions is to continue to investigate opportunities to achieve greater groundwater recharge and streamflow through cost-effective management techniques, including available silvicultural outcomes (KPI 10).



Depth to groundwater at Yarragil 4X as provided by Department of Biodiversity, Conservation and Attractions.

Many areas have been heavily harvested or are mine site regeneration, containing a large number of small trees that will not self thin and that inhibit understorey growth. Water use by these densely forested areas is also high (top left). Ecological thinning can return these forests to a more diverse structure, promoting a strong dominant canopy, increasing biodiversity and improving resilience to climate change (below left).

The remainaing trees are selected for their robustness and can grow on to be future quality sawlogs as a part of ecologically sustainable forest management.

Left top: Image of overstocked forest.
Left: Image of healthy forest.

FARM FORESTRY

Farm forestry or agroforestry is the commitment of resources by farmers, alone or in partnerships, towards the establishment or management of forests on their land. It can take many forms, including timber belts, alley plantings and widespread (fence to fence) plantings.

For farm forests to make a meaningful contribution to the local forestry industry, trees should be grown and managed to provide a commercial return to the landowner and be a part of the property's business plan. Commercially motivated plantings will have been planned with consideration for the markets that they will be supplying.

Well-planned farm forestry can have a broad range of other on-farm benefits including improved stock and crop production, carbon storage, biodiversity and amenity values, and reduced erosion and salinity. These benefits are common drivers of plantings on farms and the broader returns to the landowners can be great.

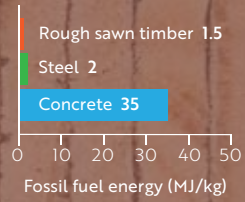
A lack of confidence in market access is a key barrier to uptake of farm forestry. A proven mechanism is through a long-term wood purchase agreement, where a farmer has an agreement with a buyer for the trees at time of harvest.

RISE IN USE OF ENGINEERED TIMBER IN CONSTRUCTION

New rules for using engineered timber products are set to revolutionise the building design and construction sector in Australia. These open the way for structural engineers to use timber for apartments, hotels and office buildings up to eight storeys.

Recently constructed timber buildings in Australia have successfully demonstrated that the innovative technology performs well, is cost effective and aesthetically pleasing whilst reducing carbon emissions. The increased use of wood also has measurable physiological and psychological health benefits. Workers are less stressed and more productive, students learn better, patients heal faster, and people are generally happier and calmer in spaces that contain natural elements like wood.

Fossil fuel energy (MJ/kg) used in the manufacture of building materials



Graph source: Ferguson, I., La Fontaine, B., Vinden, P., Bren, L., Hateley, R. and Hermesec, B. 1996, 'Environmental Properties of Timber,' Research Paper Commission by the Forest and Wood Products Research Development Corporation.

IMPROVING COMMUNITY SAFETY THROUGH MECHANICAL FUEL REDUCTION

Trials under the National Bushfire Mitigation Program aim to establish whether mechanical thinning of forests can reduce bushfire risk in an economical, socially acceptable and environmentally sound manner around key assets, such as conservation areas or townships, where prescribed burning is undesirable for a range of reasons.[3]

The Western Australian trial, at a site in the northern jarrah forest, aims to compare current controlled burn practices for fire risk reduction with mechanical fuel reduction techniques that remove the mid-storey "fuel ladders".

To be cost effective, mechanical fuel reduction will need to rely on markets for residue wood products to offset some (or all) of the costs.

To be implemented, mechanical fuel reduction will need to be covered by a regulatory operational prescription to ensure that specific considerations for issues such as weed control and biodiversity protection are appropriately managed.

[3] www.agriculture.gov.au/forestry/national/nbmp

ABORIGINAL ENTERPRISE IN THE SANDALWOOD INDUSTRY

Since December 2017 sandalwood has been processed by Dutjahn Sandalwood Oil, the first refinery of its kind in the Goldfields.

Dutjahn Sandalwood Oil currently processes 100 tonnes of sandalwood a year. The company will pay royalties to an Aboriginal foundation that aims to increase Aboriginal involvement in the sandalwood supply chain. An important initiative of the foundation will be the formation of the Dutjahn Ranger Program.

djarlma

COLLABORATING TO DELIVER EFFICIENCY

The South-west Timber Hub is a collaborative initiative focused on ensuring a long-term plan for the industry, and specifically the softwood sector. A substantial value stream mapping exercise has identified the opportunities to reduce supply chain costs through efficiency gains. This is expected to enhance the business case for plantation investment.

IMPLEMENTATION OF THE DJARLMA PLAN

IMPLEMENTATION

Within 6 months the Forest Products Commission and Forest Industries Federation of Western Australia will engage in a consultative process to deliver the Djarlma Implementation Plan, including specific, measurable, achievable and time-bound targets in support of the four outcomes of the Plan. Each target will include clear reference to who is responsible for the actions required to achieve the target. It is envisaged the Plan will be for four years and be followed by subsequent implementation plans over the life of the Plan.

MONITORING AND REPORTING

A monitoring and reporting system will be developed and managed by industry. FIFWA and the Forest Products Commission will work together to develop this system of reporting. The system will be transparent, and report annually to the government and the industry on progress while delivering the Djarlma Plan, including any recommendations for adapting the Plan as circumstances require.

COMMUNICATION

A communications strategy will be jointly developed by the Forest Products Commission and the forestry industry to promote the values of forests and woodlands, the need for more plantations and farm forests to meet growing demand, and the importance of ecologically-sustainable forest management.

ENGAGEMENT

The Forest Products Commission and the industry welcome the opportunity to collaborate with the community, businesses and government to deliver the Djarlma Plan. It will consult with interest groups, experts and the government to better understand trends and identify necessary changes in approaches, including securing opportunities created by new and emerging technologies and markets.

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KEY TERMS

Bioenergy – Bioenergy is derived from biomass to generate electricity and heat, or to produce liquid fuels for transport.

Biomass – Biomass is any organic matter of recently living plant or animal origin. It is available in many forms such as agricultural products, forestry products, municipal and other wastes.

Citizen science – the collection and analysis of data relating to the natural world by members of the general public, typically as part of a collaborative project with professional scientists.

Ecological thinning – a silvicultural treatment that involves reducing the number (density) of trees within a stand. Thinning reduces competition for water, nutrients and light, and consequently, promotes growth of the remaining trees.

Ecologically sustainable development – using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased.

Ecologically sustainable forest management – forest management that conserves biodiversity and ecological integrity, while providing ongoing social and economic benefits to the community, through the sustainable access to wood and non-wood forest resources and enjoyment of other forest values, including its use as a place for recreation .

Engineered wood products – include a range of derivative wood products that are manufactured by binding or fixing the strands, particles, fibres, veneers or boards of wood, together with adhesives, or other methods of fixation, to form composite materials. Engineered wood products are used in a variety of applications, from home construction to commercial buildings to industrial products. The products can be used for joists and beams that replace steel in many building projects.

Forestry industry – the industry is a diverse value chain from the sustainable growing and harvesting of trees in plantations and natural forests, to haulage, and processing of timber and wood fibre.

Natural capital accounting – the process of calculating the total stocks and flows of natural resources and services in a given ecosystem or region.

Other bole volume – is obtained from trees felled to obtain sawlogs. It is also obtained from trees that are removed to facilitate regeneration, or the growth of retained trees.

Silviculture – the science and practice of managing forests and woodlands to meet the wide range of needs of and benefits to landowners and the community, now and for the future. It considers the ecology, establishment, growth, health, use and quality of forests.

Social licence – ongoing approval by stakeholders or broad social acceptance.

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