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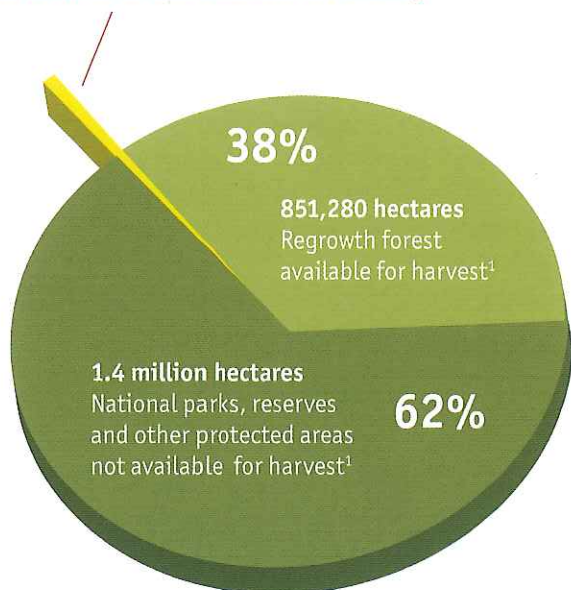
## South West native forests in Western Australia

There are approximately 2.25 million hectares of native forest vested in the Conservation Commission in the South West of Western Australia.<sup>1</sup> Of this more than 1.4 million hectares or 62 per cent is protected in national parks, reserves and other areas not available for harvest including all old-growth forests.<sup>1</sup>

**Less than 1% of the total native forest area is harvested annually. Harvested native forest is regenerated.**

Some of our major parks and reserves — Lane Poole, Big Brook, Boranup — are in fact regrowth forests, which means they have previously been harvested and successfully regenerated for everyone to enjoy.

**Less than 1%**  
of the total forest area is harvested annually



This graph represents the total native forest estate in the South West under the Forest Management Plan 2014–2023 (2.25 million hectares<sup>1</sup>).

### Sustainable forest management

Western Australia’s public native forests are sustainably managed within a comprehensive policy and regulatory framework. The Conservation Commission of Western Australia develops 10-year Forest Management Plans (FMP) which are reviewed by the Environmental Protection Authority and administered by the Department of Parks and Wildlife. The Forest Products Commission (FPC) manages the harvesting and regrowing according to the requirements of the FMP. The FPC enters into contracts to provide and sell timber products.

**Forest certification** – Timber production from the State’s forests is independently certified to the Australian Forestry Standard (AFS) and the international standard for Environmental Management Systems (EMS ISO 14001). This means that our forest harvesting practices have been through a rigorous environmental review process. Certification provides consumers with assurance that their timber products originate from responsibly managed forests.

**“In the long-term, a sustainable forest management strategy aimed at maintaining or increasing forest carbon stocks, while producing an annual sustained yield of timber, fibre or energy from the forest will generate the largest (climate change) mitigation benefit.”**

*IPCC 2007 Fourth Assessment Report, Mitigation of Climate Change, UNEP & WMO*

**Biodiversity maintained** – After harvesting, forest biodiversity recovers successfully due to regeneration practices and the resilient nature of the forest. Long-term scientific monitoring in the jarrah forest has shown that after 40 years there is no detectable difference in biodiversity between harvested and unharvested forests.<sup>2</sup>



1. Appendix 6 - Conservation Commission of Western Australia. 2013. Forest Management Plan 2014–2023. Conservation Commission of Western Australia, Perth.

2. Australian Forestry. 2011. A regional journal of forestry science and forest management - special issue: FORESTCHECK, Vol 74, no. 4.





Jarrah dining table – Support your local forest industry and local communities by purchasing Western Australia’s sustainably managed timber products.

### Why harvest native forest?

**Meeting demand** – There is strong demand from consumers for Western Australia’s unique timbers. The volume of forest products produced in Australia is insufficient to meet our country’s demand for timber based products. Australia’s net import deficit averages around \$2 billion per year.<sup>3</sup> In fact, aside from ongoing native forest timber harvesting, we need to expand our plantations to meet future consumer demand and reduce our reliance on imported timbers, some of which are from sources that are unsustainable and illegally harvested.

**Regional employment** – The State’s native forest-based timber industry directly employs more than 1,000 people<sup>4</sup> in regional Western Australia and contributes to the \$1.06 billion<sup>5</sup> per year forest industry turnover. Employment includes jobs in forest management, harvesting, transport and primary processing. Additional jobs are also created through indirect employment in regional schools, hospitals and service industries.

**Improves forest health** – Tree deaths have been occurring due to extended periods of low rainfall and high temperatures. Where trees demand more water than is available, forest thinning and management can mitigate these deaths, increase the flow of clean water to our dams to provide more drinking water, and improve the health of our rivers.

#### Did you know?

Pest animals such as foxes and cats, land clearing and urban expansion are the main threats to native flora and fauna in Western Australia.

Timber from sustainably managed forests is a renewable resource with significant environmental, social and economic benefits for all Western Australians.

3. Australian Bureau, (ABARES). Australia’s forests at a glance 2012 with data to 2010-11. ABARES, Canberra.

4. URS. 2012. Social and economic impact assessment on the potential impacts of the implementation of the Draft Forest Management Plan 2014-2023. URS Australia, Crawley, Western Australia.

5. Schirmer, J. 2008. Forestry, jobs and spending: Forest industry employment in Western Australia. CRC for Forestry, Hobart.

6. Forestry Commission England, [www.forestry.gov.uk/england](http://www.forestry.gov.uk/england)

7. Wood products & greenhouse gas impacts, [www.naturallywood.com](http://www.naturallywood.com)



### Timber, a natural choice

Trees capture and store CO<sub>2</sub> — a greenhouse gas — and carbon continues to be stored in wood products even after harvesting. As forests get older they reach a state of carbon equilibrium — the carbon they capture each year equals the amount they release through decay. As a result, harvested and regenerated forests capture more carbon from the atmosphere than forests that are not harvested.

**Timber insulates 15 times better than concrete, 400 times better than steel and 1,770 times better than aluminium, and is more efficient at heating and cooling.<sup>6</sup>**

Far less carbon emissions are produced in the manufacture of timber products than other building materials. By building a house in timber the carbon emissions saved, compared to other materials, are equivalent to running a car for seven years.<sup>6</sup>

**Timber is unique among building materials because it continues to store carbon long after the tree is harvested. Up to 50% of timber’s dry weight is carbon.<sup>7</sup>**

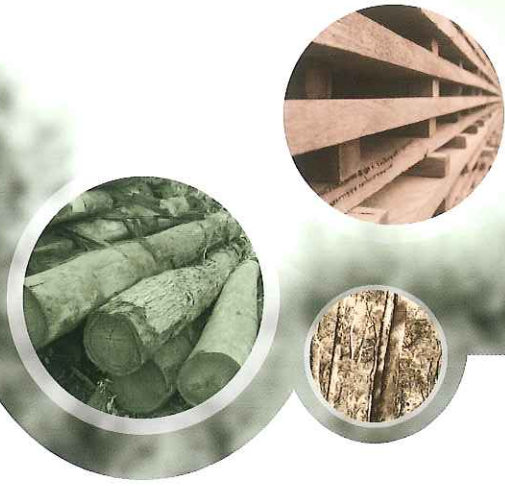
The common native species used in Western Australia are jarrah (*Eucalyptus marginata*), karri (*Eucalyptus diversicolor*) and marri (*Corymbia calophylla*). The beautiful colours, strength and durability of these unique timbers are widely used in the production of high quality furniture, flooring, decking and joinery. Residue wood from sawlog harvesting is used for other purposes such as charcoal for high grade silicon production, found in every day products we rely on such as computers, mobile phones and solar panels.

### Buy local, buy sustainable

Buying Western Australia’s sustainably managed timber products supports local manufacturing and local communities.







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## South West native forests for conservation and timber

The South West native forest area is managed in accordance with a 10-year Forest Management Plan (FMP) which is developed by the Conservation Commission of Western Australia.

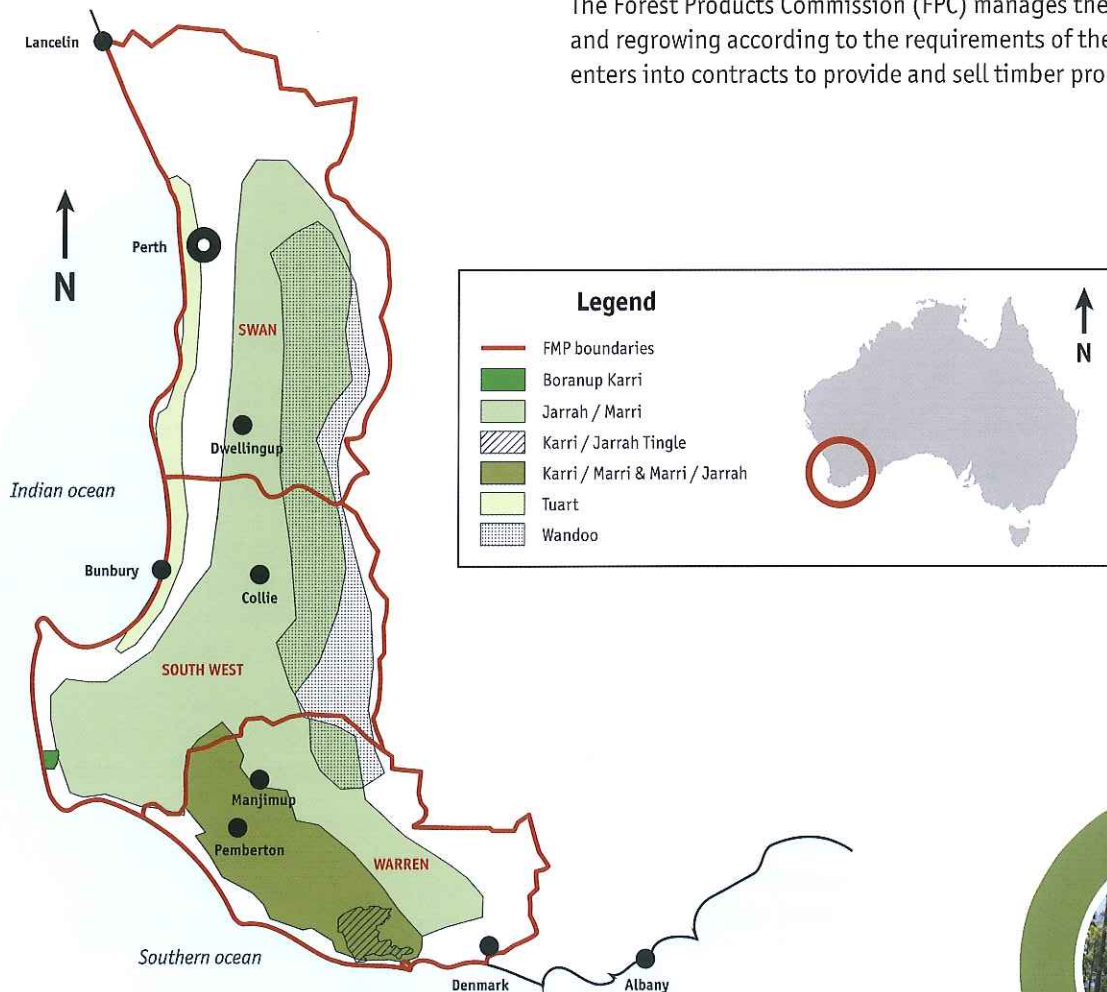
The Department of Parks and Wildlife (DPAW) has overall forest management responsibility. The FMP's objective is to conserve biodiversity and to sustain the health, vitality and productive capacity of the ecosystems. Under the FMP, the forest produces social, cultural and economic benefits.

The 2014–2023 FMP covers 2.25 million hectares of native forest in the geographic areas of the Swan, South West and Warren regions.<sup>1</sup>

**Approximately 62% or 1.4 million hectares is protected in national parks, reserves and other areas not available for harvest.<sup>1</sup> This reserved area includes all old-growth forests.**

The main forest tree species that dominate in this area are jarrah (*Eucalyptus marginata*), karri (*Eucalyptus diversicolor*) and wandoo (*Eucalyptus wandoo*). Other species include marri (*Corymbia calophylla*), blackbutt (*Eucalyptus patens*), sheoak (*Allocasuarina fraseriana*), tingle and a small area of tuart (*Eucalyptus gomphocephala*).

The Forest Products Commission (FPC) manages the harvesting and regrowing according to the requirements of the FMP. The FPC enters into contracts to provide and sell timber products.



1. Appendix 6 - Conservation Commission of Western Australia. 2013. Forest Management Plan 2014–2023. Conservation Commission of Western Australia, Perth.







The principal timber species are jarrah, karri and marri – all unique to Western Australia. The timbers are internationally renowned for their beauty and particularly in the case of jarrah and karri, their strength.

## Jarrah

Jarrah is a medium to tall tree growing up to 50 metres in height. It occurs where the annual rainfall exceeds 600 mm per annum. Jarrah trees can be found from just north of Perth to Manjimup and across to the Stirling Ranges near Albany. However, the best development occurs on the lateritic (gravelly) soils of the Darling Scarp where annual rainfall exceeds 900 mm. In this zone the forest may consist of pure jarrah.

Jarrah is very resilient in harsh conditions partly as a result of its unique root system. A young jarrah seedling develops a woody swelling (lignotuber) at ground level which provides a nutrient store and contains many dormant buds. If a jarrah seedling is damaged by fire or grazing by wild animals, it can quickly reshoot from the lignotuber. In the jarrah forest it is common for a pool of lignotubers to be lying dormant on the forest floor awaiting their chance to grow into trees.

Jarrah often grows in conjunction with marri. In the higher rainfall more fertile landscape, Western Australian blackbutt may also occur with jarrah. However, in the drier conditions to the east of the Darling Scarp, wandoo woodland gradually replaces the jarrah forest.

## Karri

On the richer soils in the South West corner of the State, where the rainfall is higher, the jarrah forest is replaced with karri.

Karri grows up to 90 metres in height making it the tallest tree in Western Australia and one of the tallest in the world. It has a long straight trunk and its smooth bark is shed each year. On the best sites it may form pure stands, however on the drier sites it is often found with marri.

**Much of the stately karri forests — as seen at Boranup and Big Brook — are in fact regrowth forests, which means they have previously been harvested and regenerated.**

Karri is different to jarrah in that it does not form a lignotuber and grows directly from seedlings. For a karri seedling to grow into a sapling, it too requires disturbance, such as fire or windstorm, at the time of establishment.

## Marri

Marri is widespread in the South West scattered in amongst the jarrah and karri forests.

Marri is a medium to tall tree growing up to 40 metres in height. It readily regenerates from either seed or lignotubers.

It is commonly known as 'red gum' due to the gum (or kino) that occurs extensively throughout the wood. This unique and natural characteristic makes sawn timber production more difficult than jarrah or karri. However, the intricate patterns of the gum are a desirable feature for furniture and flooring manufacturers.

## Silviculture

Silvicultural management of the forest varies depending on the forest type, site and forest structure, as well as the forest management objectives.

### What is silviculture?

Silviculture is the practice of managing the establishment, growth, composition, health, and quality of forests to meet diverse needs and values.

Harvesting for timber products occurs on a rotational basis in patches throughout the South West region. The different aged patches create a mosaic of forests at different stages of growth, providing a range of habitat. The total amount of timber removed from the State forest each year is less than the annual growth, making timber management in Western Australia a sustainable activity.

Every tree in a forest competes for sunlight, water and nutrients. Thinning or selective harvesting improves the growth and health of the remaining trees, in turn producing better quality trees for timber production.

Fire also plays an important role in regeneration. It is used to stimulate seed germination, release important nutrients back into the soil and temporarily remove understorey competition so that seedlings can grow.

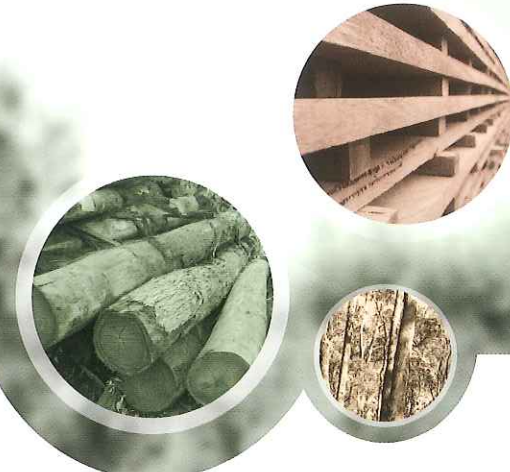
Where seeds are collected during harvesting, seedlings are used for regeneration. Seedlings can be grown and planted into the same general area following harvest.

Consumers can be confident that Western Australian timber products come from regrowth forests that are ecologically and sustainably managed to international standards for sustainability.<sup>2</sup>



2. FPC holds internationally recognised certification in Australian Forestry Standards (AFS) and Environmental Management Systems (EMS).



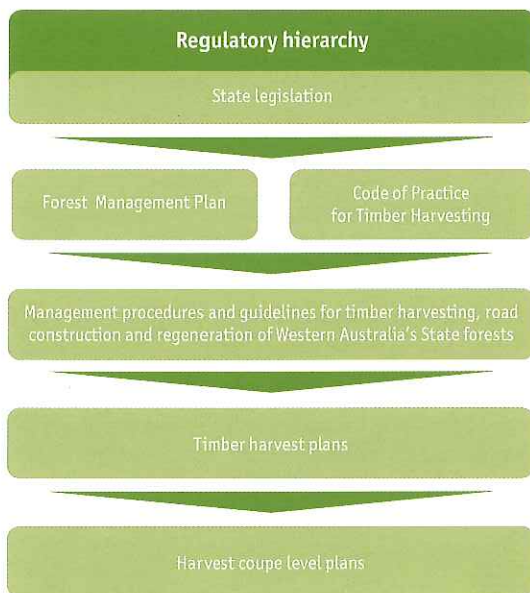


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# Forest management in Western Australia

Sustainable timber harvesting in Western Australia’s South West native forests is governed by a comprehensive legislative framework and management procedures.

The diagram below illustrates the regulatory framework associated with the management of our South West forests by the State Government and its agencies. Across the planning framework there are several opportunities for public engagement through formal and informal consultation processes.



The 2014–2023 FMP covers approximately 2.25 million hectares of native forest within the geographic areas of the Swan, South West and Warren regions.<sup>1</sup> The FMP adopts three scales of management: whole of forest, landscape and operational. Our forests support multiple uses without compromising unique ecosystems.

The area of native forest estate under the FMP is divided into two broad categories:

- land that is protected in formal reserves, national parks and other areas not available for timber harvesting (approximately 1.4 million hectares<sup>1</sup>); and
- mixed regrowth forest available for harvesting (just over 850,000 hectares<sup>1</sup>).

Strict volume limits are also stipulated in the FMP to ensure the amount of timber removed is sustainable, through natural regeneration and growth of trees throughout the forest.

Within the areas available for timber harvesting, additional zones are excluded to further ensure biodiversity protection. These zones include:

### Informal reserves

Informal reserves cover various types of forest including old-growth forest; rivers and stream zones; travel route zones; diverse ecotype zones (DEZ); less well reserved vegetation complexes and forest ecosystem and Regional Forest Agreement accredited linkage zones. Most timber harvesting operations are excluded from informal reserves except for some travel routes in the Warren Region.

### Fauna Habitat Zones (FHZ)

FHZs are areas of forest specifically managed for the conservation of flora and fauna during each timber harvest rotation. Areas classified as FHZs form a network designed to complement existing conservation reserves and ensure biodiversity recovers between one timber harvesting rotation and the next. Within the zones fauna populations are maintained to permit recolonisation of nearby areas following timber harvesting.

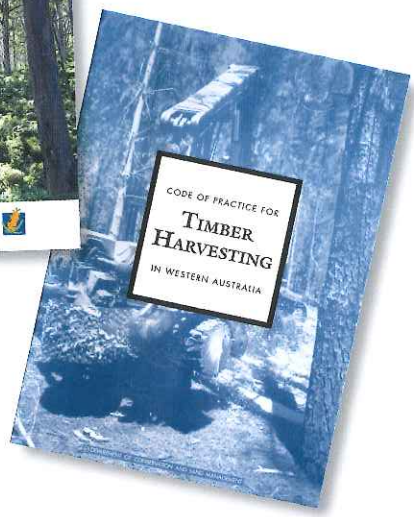
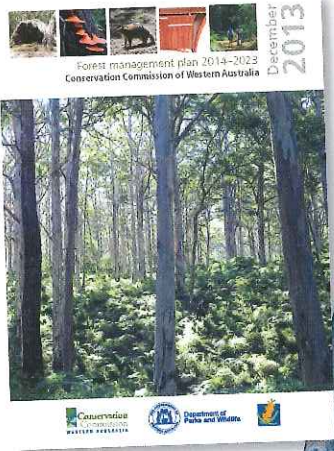
The Forest Management Plan (FMP) provides a framework over a 10-year period for the sustainable management of our South West native forests for a range of environmental, social and economic uses. The FMP is developed by the Conservation Commission of Western Australia in consultation with the community and experts in forestry, botany, wildlife biology, catchment management, water resource management, cultural heritage and recreation planning. It is reviewed by the Environmental Protection Agency (EPA) and approved by the Minister for Environment.

The Department of Parks and Wildlife (DPaW) and the Conservation Commission of Western Australia are the regulatory bodies overseeing compliance with the FMP. The Forest Products Commission (FPC) is responsible for conducting commercial forest operations through sustainable practices and operates under the *Forest Products Act 2000*.

1. Appendix 6 - Conservation Commission of Western Australia. 2013. Forest Management Plan 2014-2023. Conservation Commission of Western Australia, Perth.







### Timber harvesting plans

Under the FMP, DPaW develops three-year rolling harvest plans. These plans specify locations, type and volume of timber to be harvested based on the FMP sustainable yields. This allows the FPC to plan ahead and ensure all the relevant checks and approvals are sought prior to harvesting.

The FMP also requires FPC to develop annual harvest plans. The annual harvest plan is based on DPaW's three-year harvest plan and identifies the forest coupes which are intended to be harvested during that year.

DPaW and FPC work collaboratively in producing the three and one-year harvest plans. FPC makes the one-year plans available to the public for comment.

**Harvest coupe level plans** are the very detailed operational documents under which FPC and its harvesting contractor must operate. These are developed by FPC and approved by DPaW.

### High environmental standards

The FPC is committed to sustainable forest management to the highest standards. It is certified to the Australian Forestry Standard (AFS) and the international standard for Environmental Management Systems (EMS ISO 14001). These certifications are received after rigorous, ongoing auditing and assessment by an external, licensed and independent auditing firm to ensure our business meets the requirements of the regulatory framework.

### Code of Practice for Timber Harvesting

The Code of Practice for Timber Harvesting in Western Australia, developed in 1999 by the Department of Conservation and Land Management (CALM)<sup>2</sup>, provides a suite of requirements for the conduct of timber harvesting operations on State forest and other Crown lands. These requirements include provisions for the maintenance of environmental values.

### Management procedures and guidelines

Manuals for timber harvesting and road construction have been developed by the FPC in accordance with the Code of Practice for Timber Harvesting and the FMP, as well as legal and specific operational provisions. The manuals offer more detailed direction to FPC staff and contractors with regards to carrying out harvesting and road construction operations and associated activities.

In addition, operational guidelines and procedures have also been developed by DPaW. Silvicultural guidelines relating to each of the main forest-types (jarrah and karri) detail the management requirements such as habitat retention, regeneration and rehabilitation following harvesting. Soil and water management guidelines are also prepared by DPaW to lessen the likelihood of damage to soils from the use of heavy machinery in wet soil conditions and to maintain water quality and quantity.



2. CALM has since become the Department of Parks and Wildlife (DPaW).







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## Managing biodiversity

Biodiversity is the variety of all living things – the different plants, animals and micro-organisms, the genetic information they contain and the ecosystems they form.

A key requirement of sustainably managing Western Australia's South West forests is ensuring the protection of biological diversity, including threatened species of flora and fauna and their habitat.

The Forest Management Plan (FMP) sets three scales of management to achieve this:

- whole of forest;
- landscape; and
- operational.

### Whole of forest level

At the whole of forest level, large areas of forest are set aside in reserves which are unavailable for timber harvesting.

Under the 2014–2023 FMP, more than 1.4 million hectares or 62 per cent of forest vested in the Conservation Commission is protected in national parks, conservation parks, nature reserves and other reserves.<sup>1</sup> This is in excess of the national standard for biodiversity protection.

This system of reserves ensures that flora and fauna across a wide range of ecosystems are represented and conserved.



Trees which contain hollows suitable for nesting are marked with a 'H' to identify them as habitat trees. Under the 2014–2023 FMP, the Forest Products Commission is required to retain 11 to 13 habitat and potential habitat trees per hectare. Further, additional large marri trees are required to be protected.

### Did you know?

Pest animals such as foxes and cats, land clearing and urban expansion are the main threats to native flora and fauna in Western Australia.

### Landscape level

At the landscape level, in addition to national parks and reserves, other areas are also protected from harvesting. For example:

- Fauna habitat zones ensure species dependent on undisturbed mature forest, are maintained within an area.
- Buffer zones along rivers, creeks and other hydrological features protect our water quality.
- Diverse ecotype zones – which are important for biodiversity conservation and include rocky outcrops, wetlands, sedge and herb vegetation – are demarcated out of the area to be harvested and are protected from disturbance.
- Buffer zones around rare flora or endangered fauna habitat safeguard delicate communities.
- All 'patches' of old-growth forest over two hectares are excluded from timber harvesting.

### Operations level

At the operational level, further protection measures are put in place to protect biodiversity and limit the extent of disturbance from operations. For example:

- Habitat trees and logs with hollows are retained to ensure birds and other animals have sufficient places to live and nest in the future.
- Surveys are undertaken to locate patches of old-growth forests not already identified on maps.
- Surveys are undertaken to identify the presence of significant flora and fauna.



1. Appendix 6 – Conservation Commission of Western Australia. 2013. Forest Management Plan 2014–2023. Conservation Commission of Western Australia, Perth.





Regrowth karri forest – Harvesting occurs on a rotational basis in patches throughout the South West of Western Australia. The different aged patches create a mosaic of forests at different stages of growth.

### Scientific monitoring supports current forest management practices

FORESTCHECK, a long-term scientific study, has given Western Australian native timber harvesting and silviculture practices in the South West jarrah forests a favourable report card in conserving biodiversity.

Biodiversity elements sampled included fungi, flowering plants, ferns, insects, birds, mammals and reptiles. In addition, measurements of forest structure (species and age), number of trees regenerated, leaf and soil nutrients, amount of leaf litter and coarse wood debris and degree of soil disturbance and compaction are undertaken.

The key findings are:

- Most species groups in the jarrah forest are resilient to the disturbance from timber harvesting.
- Recently disturbed forest is rich in biodiversity.
- Some species are favoured by disturbance.
- After 40 years, there is no detectable difference in species richness between harvested and non-harvested forest.

The biodiversity present in our regrowth forests today highlights the fact that species do survive and return following timber harvesting.

### Water

Forest ecosystems, including the fauna and flora which live within them, rely heavily on water supply and quality through the ambient rainfall and ground flows.

Buffer zones around surface water features, such as streams and dams, help protect water quality – which is essential for dependent fauna and flora species as well as water for human use.

Selectively harvesting trees (thinning) along with other silvicultural measures can also assist in increasing the flow of water to surface and ground water reservoirs in extended periods of low rainfall.

### On-going biodiversity management

Surveys and monitoring by the Department of Parks and Wildlife as well as studies such as FORESTCHECK, all contribute to the knowledge of threatened species distribution patterns and habitat requirements. This knowledge is used to improve on-going biodiversity management in Western Australia.

Following harvesting operations, the Forest Products Commission regenerates the forest to ensure fauna habitats are maintained and new trees grow back to sustain our forests for the future.







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## South West native forest planning process

Producing sustainably sourced timber from Western Australia's native forests requires years of planning, a comprehensive legislative framework and management procedures with ongoing independent checks and balances. This ensures the forest ecosystem is protected and future tree growth promoted.

### What areas are available to FPC for harvest?

There are approximately 2.25 million hectares of native forest and woodlands in the South West of Western Australia under the 2014–2023 Forest Management Plan (FMP).<sup>1</sup> A huge expanse of that is protected in national parks, reserves and other areas not available for harvest including all old-growth forests.

Of the total, 38 per cent or approximately 850,000 hectares of regrowth forest is available for timber harvesting with strict limitations on the volume of timber to be extracted.<sup>1</sup> Less than one per cent of the native forest is harvested annually.

The area available for sustainable harvesting is governed by a ten-year FMP. The FMP is based on ecologically sustainable forest management principles and takes a whole of forest, landscape and operational management approach.

Under the FMP framework, the Department of Parks and Wildlife (DPAW) develops three-year harvest plans showing where harvesting can take place. The Forest Products Commission (FPC), in consultation with DPAW, then prepares its annual harvest plans. FPC makes the one-year harvest plans available to the public for comment.

### How are harvest areas identified?

Areas of forest suitable for harvesting are identified by specialist staff in DPAW and FPC following rigorous planning processes.

The planning process begins with a review of forest records to identify likely candidate harvest areas called 'coupes'. This review includes consideration of such things as previous harvest history, fire history, forest type and quality, ecological values and distance to customers.

Following the identification of candidate coupes, field inspections are undertaken to confirm their suitability for inclusion into the harvest plan. Finally, candidate coupes are selected to make up the harvest plan in accordance with the specified log volumes allowed by the FMP.



Regrowth karri forest near Pemberton.

1. Appendix 6 - Conservation Commission of Western Australia. 2013. Forest Management Plan 2014-2023 Conservation Commission of Western Australia, Perth.





Regular audits and checks of operational activities ensure compliance with strict environmental and safety requirements.

### Harvest coupe planning

Once coupes are identified on the harvest plan, detailed coupe level planning can commence.

Coupe level planning is guided by relevant codes of practice, manuals, and guidelines in the following areas:

- disease and hygiene management;
- water and hydrology;
- silvicultural practices; and
- occupational safety and health.

Some of the key components of the coupe level planning requirements include:

- *Phytophthora cinnamomi* (dieback) disease mapping and the development of hygiene management plans to prevent spread of the disease.
- A review of the presence of old-growth forest and any relevant management considerations.
- A review of any sensitive flora and fauna values that require specific management actions.
- A review of sites of cultural significance – both indigenous and European.
- Consultation with traditional owners, neighbours and stakeholder groups.
- Development of road management plans to identify which roads heavy vehicles are permitted to use.
- Completion of a pre-harvesting checklist which ensure that all values are considered prior to harvesting so that they can be effectively managed.

The pre-harvesting checklist and final coupe level plans are passed on to DPaW for comment and approval before any operations can begin.

### How are the plans translated into action?

Once approved by DPaW, the coupe level plans are implemented by the FPC. Initially this involves the field demarcation of harvest boundaries, stream zone buffers and any other management zones. These boundaries are marked in the field using white painted crosses.

Within the harvest areas, trees to be retained are marked with white painted rings. A number of other habitat elements are also retained such as logs and understorey. Habitat trees, which are retained to ensure birds and other animals have sufficient places to live and nest in the future, are marked with a large white 'H'.

The FPC is responsible for employing and managing trained contractors to undertake harvesting operations. Contractors are also engaged for road construction and maintenance as well as post-harvest treatments to regenerate the forest.

The contracting crew is provided with relevant information contained in the coupe level harvest plan and must work within its requirements. FPC staff perform regular monitoring and audits to check that all requirements are being followed.

**At all times the safety of people working or visiting the harvest coupe is of paramount importance. For this reason access to active harvest coupes is restricted.**

Following the completion of harvesting operations the FPC then plans for and completes all forest regeneration requirements.

### Who ensures FPC adheres to the management actions as outlined in the coupe plan?

All FPC activities undergo rigorous internal and external auditing to ensure compliance with the relevant legislation, regulations, codes of practice, manuals, plans and guidelines.

The FPC is certified to the Australian Forestry Standard (AFS) and the international standard for Environmental Management Systems (EMS ISO 14001). These certifications are received after thorough, ongoing auditing and assessment by an external, licensed and independent auditing firm.

Additionally, DPaW conduct compliance checks and audits on both FPC's systems and operations on a regular basis.

The FPC produces and publishes an annual FMP Compliance Report on its website.







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## Regrowing our South West native forest

The Forest Products Commission (FPC) replants and re-seeds forest areas where harvesting takes place to ensure our forests grow back for the use and enjoyment of future generations, to provide habitat for native fauna and to maintain and enhance the biodiversity of the forest.

Regrowing our forests is a critical part of sustainable forest management.

### How does this process work?

Eucalypt trees regrow from seed and when conditions are suitable, thousands of seeds germinate naturally in the forest. However, it is only when a disturbance, such as a wildfire, occurs that competition for moisture, light and nutrients are reduced and germinating seeds become established seedlings and continue to develop into young trees.

Jarrah is a common tree species in the South West and is well adapted to dealing with disturbance. Jarrah trees develop lignotubers – woody swellings at the base of the seedlings that act as a store of nutrients and dormant buds. If a jarrah seedling is damaged by fire or grazing by wild animals, it can quickly reshoot from the lignotuber. In the jarrah forest it is common for a pool of lignotubers to be lying dormant on the forest floor awaiting their chance to grow into trees.

Karri, another common tree species in the South West, is different to jarrah in that it does not form a lignotuber and grows directly from seedlings. For a karri seedling to grow they too require disturbance at the time of establishment otherwise most seedlings are suppressed and die from the surrounding forest competition.

As young trees grow they must compete with each other for growing space, sunlight, water and nutrients. In our South West forests these requirements are limited. When there is not enough to go around the more vigorous healthy trees suppress the weaker. Gradually over time the weaker trees will die leaving the stronger to continue to grow. This process continues over the life of the trees until in old age, where less than 100 per hectare may remain.

Interestingly, the tree species in our South West forest do not continue to grow to the same great age like some other forest trees of the world. Studies have shown that large old trees in the South West are usually in the vicinity of 300 to 400 years, with very few exceeding this age mainly because of natural environmental factors such as fire.

### Silvicultural guidelines

Regrowing of the forest following timber harvesting is modelled on the natural processes by which the forest would normally regenerate from disturbance.

Based on years of research, observation and independent reviews, the Department of Parks and Wildlife (DPAW) have developed comprehensive silvicultural guidelines for the main forest types subject to timber harvesting.

Silviculture is the practice of managing the establishment, growth, composition, health and quality of forests to meet diverse needs and values. A number of objectives are considered when developing silvicultural prescriptions for a given area.



Jarrah seedlings begin to emerge following a controlled regeneration burn.







## Fire as a natural tool

Because Western Australia's eucalypt forests regenerate naturally following fire, the use of controlled fire is a key element of silvicultural practice following timber harvesting. It is also important for maintaining biodiversity.

Prescribed burning is used to:

- stimulate seed germination;
- create a suitable seed bed;
- release important nutrients back into the soil;
- temporarily remove understorey competition so that seedlings can grow; and
- reduce fuels following thinning to provide protection to young vigorous forests from wildfire.

More general prescribed burning can also help to protect all of our forests from potentially devastating wild fires by removing thick understorey growth and debris.

## Monitoring

FPC harvesting and regeneration operations are closely monitored internally by FPC and externally by DPaW staff to ensure regeneration outcomes are achieved.

Additionally, both the DPaW and the Conservation Commission of Western Australia frequently conduct independent audits of FPC operations to ensure compliance with requirements and standards are maintained.

## Record keeping

A key element of the regeneration process is the collection and storage of operational outcomes so that future regeneration requirements can be planned and scheduled. This important activity is managed by DPaW who maintain a computer based program called SILrec, which captures all of FPC's harvesting and regeneration operations on regular basis.

## Sustainable forest management

The FPC is certified to the Australian Forestry Standard (AFS) and the international standard for Environmental Management Systems (EMS ISO 14001). Through regular, third party, independent audits every part of FPC's business is scrutinised and FPC's operations are continuously improved.

These certifications and FPC's sustainable forest management practices ensure our forests continue to provide not only a sound supply of renewable timber for present and future generations, but also maintain their environmental values and social services.



Young karri regeneration at Rainbow Trail (part of Big Brook Dam recreation area) in 1934. The area was harvested in the late 1920s.



The same spot 64 years later in 1998.



The same spot 78 years later in 2012.

