

# SFM Western Australia Limestone Forest Management Unit (SFM-WAL-FMU)

## Water Impact Assessment

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SFM acknowledges the traditional custodians of the land which we manage.

We show respect to their culture and their elders who have managed the land in the past.

## REVISION AND APPROVAL

This document will be reviewed whenever significant changes occur.

Version	Changes	Date
V1	Draft document	28 Feb 2018
V2	Final Document	22 Sep 2018
V3	Updated for NFSS	16 Sep 2019
V4	Minor Update	27 Jan 2022
V5	Update- NRM waterway strategies	26/05/2023

Approved for use:  Andrew Morgan Managing Director	
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# 1 Introduction

SFM Environmental Solutions Pty Ltd (SFM) is the appointed Property Manager for the Limestone Plantations *Eucalyptus globulus* (Blue Gum) assets located in the south west of Western Australia (WA).

This document provides a water impact assessment for the Western Australian Limestone Forest Management Unit (SFM-WAL-FMU).

## 2 Hydrological flows and catchment management goals

The Limestone Plantations in Western Australia are located within two NRM Regions, the South West NRM region and the South Coast NRM region. The South West Catchments Council Inc is responsible for catchment management in the South West Region, and the relevant catchment management authorities for Limestone Plantations in the South Coast NRM region are the South Coast NRM, and the Wilson Inlet Catchment Committee and Oyster Harbour Catchment Group.

### 2.1 South West NRM Region

The South West Catchments Council Inc (SWCC) is made up of five Basins. The Peel-Harvey Catchment Council has recently become its own regional NRM body and is not included in the SWCC (see Figure 1):

- Leschenault (4,808 sq km);
- Geographe (2,000 sq km);
- Cape to Cape (1,048 sq km);
- Blackwood (23,500 sq km);
- Warren (9,500 sq km).



**Figure 1.** Boundary of the SWCC sub regions/basins (**Source:** [South West NRM Strategy](#))

One property in the Limestone Plantations, Lucknow, is located in the Blackwood Basin. The Blackwood Basin covers approximately 23,500 square kilometers, extending from the coast at Augusta, and eastwards to the Shire of Boyup Brook, the Shire of Woodanilling, and the Shire of Dumbleyung. The Blackwood Basin, due to its size and variation in rainfall has been split into three areas, Lower Blackwood, Middle Blackwood, and Upper Blackwood. The relevant area to Limestone Plantations is the Middle Blackwood Basin which contains the towns of Bridgetown, Greenbushes and Boyup Brook (see Figure 2).



**Figure 2.** Boundary of the Blackwood Basin (**Source:** [South West NRM Strategy](#))

## **2.2 South Coast NRM Region**

The South Coast NRM Region is split into seven sub regions (Figure 3). Five of the Limestone Plantations sit within the Albany Hinterland region which contains three catchments:

- Wilson Inlet (2,254 sq km);
- Oyster Harbour (3,000 sq km);
- Eastern Hinterland (approximately 2,300 sq km).



**Figure 3.** South Coast NRM Sub Regions (**Source:** [South Coast NRM](#))

One property, Maringa West, occurs in the Wilson Inlet Catchment. This catchment covers approximately 2,254 square kilometers and includes 4 main river and creek systems that feed into the inlet which include Denmark, Hay, Sleeman, and Little Rivers and the Cuppup creek (see Figure 4).



**Figure 4.** Boundary of the Wilson Inlet Catchment (**Source:** [Wilson Inlet Catchment Committee](#))

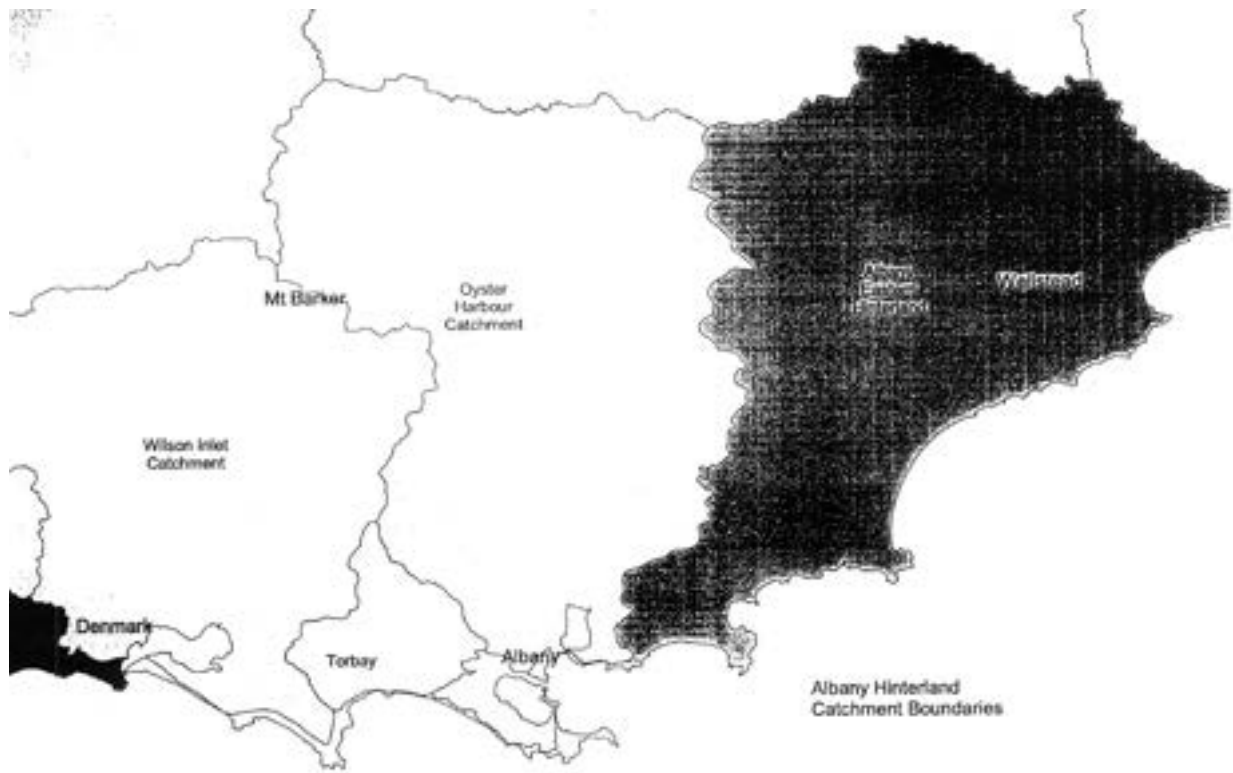


Three properties occur in the Oyster Harbour Catchment. This catchment is approx. 3,000 square kilometers in size and stretches from Albany in the south to Tenterden in the north (Figure 5).



**Figure 5.** Boundary of the Oyster Harbour Catchment (Source: [The Oyster Harbour Catchment Group Inc.](#))

The remaining property, Cheynes (East and West), occurs in the Albany Eastern Hinterland catchment which is approximately 2,300 square kilometres in size and bounded by the Stirling Ranges in the north, the Pallinup River in the east, the coast to the south, and the Oyster Harbour Catchment to the west (see Figure 6). Included in the catchment are the towns of Manypeaks, South Stirlings, and Wellstead. There are no major rivers in the area but various smaller rivers draining towards the coast including the Waychinicup, Cordinup and Eyre Rivers. Most of the area is internally drained to lakes or swamps.



**Figure 6.** Boundary of the Albany Eastern Hinterland Catchment (**Source:** [Inventory of sub-catchments within the Albany eastern hinterland](#))

### 3 Plantations and Water Use in WA

In June 2009, the Department of Water in WA released a document called “Plantation forestry and water management guideline”. This guideline suggests that negative impacts of plantation forestry on water are:

- Plantation forestry is a significant water resource management issue and can result in less groundwater and stream flow.
- Plantations can trigger the release of sulfuric acid and metals from soils into streams.

Positive effects of plantation forestry are:

- A reduction in stream salinity
- A reduction of the effects of soil salinity on plant growth

The 2007 publication titled [Plantations and Water Use](#) by Parsons *et al.* identified that the effects of industrial plantations on water yield can potentially be minimised by four factors:

- Targeting new plantation establishment in lower rainfall areas (<800 mm/year) where reductions in water yields are smaller.

**The majority of the WA plantations in the Limestone Plantations estate are in areas with annual rainfalls from 650mm to 880mm (see Appendix 2)**

- Dispersing plantations across the landscape and keeping them to less than 20% of a catchment.

**Properties within the SFM-WAL-FMU range from 106ha to 732ha, with an average area of 407.6ha. They are dispersed across different sub-catchments (see Appendices 2). The maximum area of SFM-WAL-FMU land contained within a catchment (Oyster Harbour) is 0.5%.**

- Phasing planting to give a spread of age classes; and

**The WA Limestone Plantations consist of an extremely small area spread across four different catchments therefore phasing planting will have negligible impact on water.**

- Thinning plantations to maintain them at a lower stocking density.

**Blue gum plantations grown over short rotations for pulp wood production cannot be economically thinned. Work being undertaken in Tasmania to grow Blue gum plantations over 25-year sawlog/peeler log regimes may flow through to the WA with time, resulting in potential opportunities for commercial thinnings to be utilised in some stands. Coppiced stands are thinned on time to ensure that water use is optimised.**

## 4 Waterway Strategies

In Western Australia, there are several water management bodies regulating different aspects of water, however primary responsibility falls to the Department of Water and Environmental Regulation (DWER). DWER manage water and environmental issues at a high level, while Regional Natural Resource Management Groups (NRM's) manage water at a finer scale.

Western Australian catchments are split into seven not-for-profit Regional Natural Resource Management Groups, primarily funded to deliver the National Landcare Programme. Each group has developed a regional strategy and investment plan that addresses significant NRM issues within their region. The relevant NRM Groups to the SFM-WAL-FMU are the South West Catchment Council (SWCC) for the South West Region, and the South Coast NRM Inc for the South Coast NRM Region. The Oyster Harbor Catchment Group Inc & the Wilson Inlet Catchment Committee also contribute to specific catchment management goals for the South Coast NRM Inc.

### 4.1 South West Region

The SWCC Regional NRM Strategy 2021-2030 is the key strategy for the South West Region. It provides a strategic framework for the future management, protection, rehabilitation and improvement of the region's natural resources.

The three priority investment areas identified in the strategy are:

- Biodiversity- terrestrial, aquatic, coastal
- Land resources
- Water resources

The SWCC 2030 aspiration for the water resources priority area is – **“Water quality is greatly increased and water resources are sustainably accessible in the quantities required to support ecosystems and communities, through community and industry understanding water is a precious resource and managing it effectively.”**

The SWCC developed actions as priorities for investment:

- Reinststate Natural Waterways
- Maintain and improve ground water within the region
- Improve urban stormwater management and water use efficiency
- Manage the effects of climate variability on water resources

There is only one property in the SFM-WAL-FMU that is within the South West Region. This property, Lucknow, does not have any drainage flows (see Appendix 2) that impact on lakes, wetlands, estuaries or rivers listed as priority assets.

## 4.2 South Coast Region

The South Coast NRM Inc has released Southern Prospects – a strategy to guide investment in natural resource management on the South Coast of Western Australia for the period 2019 – 2024. The stated vision is 'looking after where we live – communities caring for their environment. The document lists key outcomes organized under the themes of regional capacity, land, biodiversity, water, coastal and marine, and cultural heritage. For the theme of water, the aspiration is '**South Coast, rivers, estuaries, wetlands and water resources are recognised as precious and are maintained, protected, and/or restored with social, cultural, economic and ecological values**'. The key outcomes listed are:

- W1 Improve knowledge and understanding
- W2 Increased knowledge and awareness of climate change mitigation and adaptation
- W3 The condition of impacted and degraded waterways is improved
- W4 Low impacted and pristine waterways are protected
- W5 Ramsar Wetlands are protected
- W6 Sustainable urban and rural water resource management and use

SFM has assessed the drainage flows for each property in the SFM-WAL-FMU (see Appendix 2), which enables the identification of flows into estuaries, river reaches and wetlands. Only one property in the South Coast Region has a drainage/creek system that drains into tributaries leading to the Wilson Inlet.

An identified issue for Wilson Inlet is phosphorus export from diffuse agricultural sources including grazing, cropping and some farm forestry. SFM employs management practices to avoid off target phosphorus impacts, detailed in the next section.

## 4.3 SFM management practices

Best management practice for nutrient and sediment management is routinely achieved across all properties in the SFM-WAL-FMU by:

- Re-establishing as soon as possible after harvesting to minimise exposure of bare soil.
- Using a combination of coppicing and seedling established techniques, which minimises soil disturbance across the estate and, in some cases across the property.
- Not using deep ripping of soils for 2<sup>nd</sup> rotation replanted sites. Existing planting rows are simply re-mounded (where slopes are suitable).
- Optimising the application of fertiliser by taking foliar samples for coppiced plantations to ensure that only required nutrients are delivered.
- Using stream side buffers and drainage to minimise potential for sedimentation and nutrients to move into waterways.
- Working with the relevant catchment management bodies to identify waterway revegetation opportunities.

- Undertaking site visits with government and NGO's to assess wetlands and the options for their restoration.

## 5 Socio-economic analysis

Australia's total commercial plantation area is approximately 1.77M hectares located within 15 regional hubs. Western Australia is considered a hub for plantation forestry and contributes approximately 309,800 hectares (17%) to the nation's plantation estate, 166,400 hectares of this area is Tasmanian bluegum (9% of national plantation forestry area). 33% of the Tasmanian blue gum hardwood plantations in Australia are in the Western Australia hub.

Plantations provide most of the timber used in Australia to manufacture products for home building, paper and other products. Much of this is processed locally and timber industries are major employers in some regional communities.

The ABARES "[Australian Plantation Statistics and Log Availability 2021](#)" and the Australian Forest Products Association (AFPA) titled "[Plantations – The Missing Piece of the Puzzle](#)" has identified the following facts for the Western Australian hub:

- Total plantation area of 309,800 hectares;
- The major plantation companies in the Western Australian hub are:
  - PF Olsen (PFO)
  - Australian Bluegum Plantations (ABP)
  - Forest Products Commission (FPC)
  - WAPRES
  - Bunbury Fibre Plantations (BFP)
  - Albany Plantation Forest Company (APFL)
- The Forest Products Industry dependent on the resource includes:
  - Wespine (sawmill)
  - WAPRES / Marubeni (woodchip export / port)
  - Bunbury Fibre / Mitsui (woodchip export / port)
  - Laminex (Dardanup) (Particleboard and medium density fibreboard)
  - Albany Plantation Export Company (woodchip export / port)
- The forest industry in these hubs employs 4,500 people.

In the 1<sup>st</sup> rotation over 23,000 tonnes of wood was harvested from the six properties included in the SFM-WAL-FMU (see Appendix 2), contributing towards economic and social benefits along the harvest and transport supply chain. Tending operations being undertaken across the SFM-WAL-FMU are contributing to sustainable livelihoods for local suppliers and contractors involved in silvicultural activities such as trial measurement, noxious and environmental weed spraying, forest mensuration, and general maintenance operations. SFM's employees, and many local contractors who perform work on the properties in the SFM-WAL-FMU, live or stay in regional towns in the South West/South Coast of Western Australia. The Limestone Plantations estate in Western Australia also

provides for a range of other non-forest values, including affordable building rental and grazing.

## 6 Bibliography

Australian Forest Products Association (2015) [Plantations – The missing piece of the puzzle](#). Canberra, ACT (31 pages).

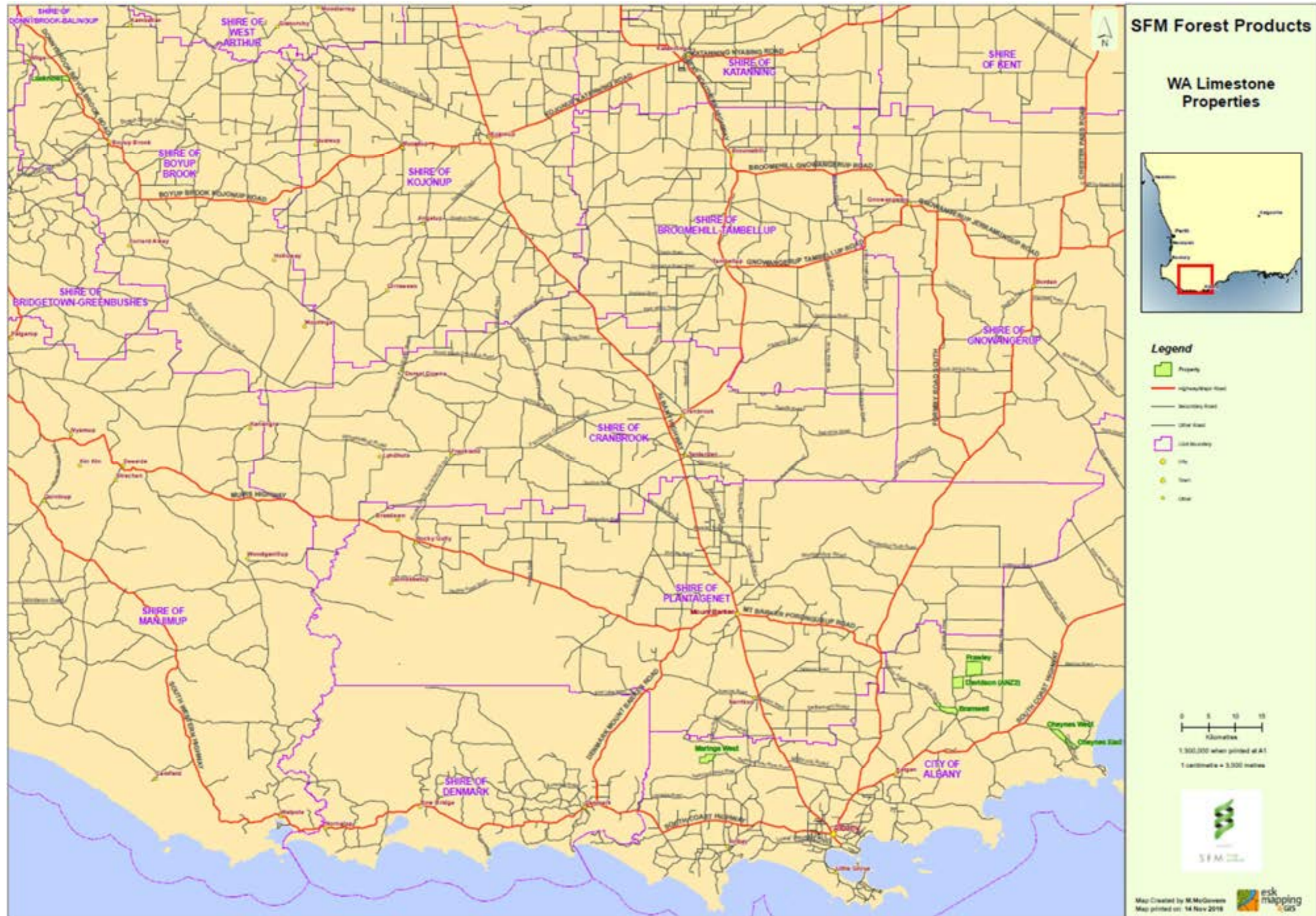
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Appendix 1 – Map showing properties in the SFM-WAL-FMU



## Appendix 2 – Catchment summary for properties in the SFM-WAL-FMU

Property Name	Ave Rainfall (mm/annum)	Elevation (MASL)	IBRA V7 Bioregions	IBRA V7 Subregions	NRM Region	Catchment Management Body	Catchment	Sub-Catchment	Basin	Public Drinking Water	Hydrological Zone	Hydrological Zone Description	Drainage Flows (assessed by SFM)
<b>Bramwell</b>	882	100-120	JAF - Jarrah Forest	JAF02 - Southern Jarrah Forest	South Coast NRM Inc.	Oyster Harbour Catchment Group Inc	Oyster Harbour	Oyster Harbour_Kalgan_King	Albany Coast	No	Albany Sandplain	AS - Gently undulating plain dissected by a number of short rivers flowing south. Eocene marine sediments overlying Proterozoic granitic and metamorphic rocks. Soils are sandy duplex soils, often alkaline and sodic, with some sands and gravels.	NA
<b>Cheyne</b>	717	40-80	ESP - Esperance Plains	ESP01 - Fitzgerald	South Coast NRM Inc.	South Coast NRM Inc.	Albany Eastern Hinterland	Waychincup River	Albany Coast	No	Albany Sandplain	AS - Gently undulating plain dissected by a number of short rivers flowing south. Eocene marine sediments overlying Proterozoic granitic and metamorphic rocks. Soils are sandy duplex soils, often alkaline and sodic, with some sands and gravels.	NA
<b>Davidson</b>	882	120	JAF - Jarrah Forest	JAF02 - Southern Jarrah Forest	South Coast NRM Inc.	Oyster Harbour Catchment Group Inc	Oyster Harbour	Oyster Harbour_Kalgan_King	Albany Coast	No	Albany Sandplain	AS - Gently undulating plain dissected by a number of short rivers flowing south. Eocene marine sediments overlying Proterozoic granitic and metamorphic rocks. Soils are sandy duplex soils, often alkaline and sodic, with some sands and gravels.	NA
<b>Frawley</b>	882	120-130	JAF - Jarrah Forest	JAF02 - Southern Jarrah Forest	South Coast NRM Inc.	Oyster Harbour Catchment Group Inc	Oyster Harbour	Oyster Harbour_Kalgan_King	Albany Coast	No	Albany Sandplain	AS - Gently undulating plain dissected by a number of short rivers flowing south. Eocene marine sediments overlying Proterozoic granitic and metamorphic rocks. Soils are sandy duplex soils, often alkaline and sodic, with some sands and gravels.	NA
<b>Lucknow</b>	649	300-330	JAF - Jarrah Forest	JAF02 - Southern Jarrah Forest	South West NRM	South West Catchments Council Inc	Blackwood	Hardy Estuary_Blackwood River	Blackwood River	No	Western Darling Range	Moderately dissected lateritic plateau on granite with deeply incised valleys, includes the Darling Scarp on the western margin. Soils are formed in laterite, lateritic colluvium & weathered in-situ granite & gneiss.	NA
<b>Maringa West</b>	810	80-90	JAF - Jarrah Forest	JAF02 - Southern Jarrah Forest	South Coast NRM Inc.	Wilson Inlet Catchment Committee	Wilson Inlet	Wilson Inlet_Hay River	Denmark Coast	No	Albany Sandplain, Warren-Denmark	AS - Gently undulating plain dissected by a number of short rivers flowing south. Eocene marine sediments overlying Proterozoic granitic and metamorphic rocks. Soils are sandy duplex soils, often alkaline and sodic, with some sands and gravels. WD - Rises in a series of broad benches from the Southern Ocean north to the Blackwood Valley. Deeply weathered granite and gneiss overlain by Tertiary and Quaternary sediments in the south. Swampy in places.	Drains run south, connect with other drains, and down to Wilson Inlet.