



# SOUTH COAST REGION REGIONAL FUEL MANAGEMENT PLAN



Department of Biodiversity,  
Conservation and Attractions

GOVERNMENT OF  
WESTERN AUSTRALIA



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## Custodian

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# 1. Introduction

This regional fuel management plan (RFMP) assesses risks associated with bushfire in the Parks and Wildlife Service of the Department of Biodiversity, Conservation and Attractions' (the department) South Coast Region to assist planning the department's fuel management program. It interprets the department's Bushfire Risk Management Framework into regional indicators of acceptable bushfire risk and recommends tactics by which these may be achieved. The annual comparison of the current landscape condition to the indicators will inform planning for fuel management in the region.

The RFMP addresses bushfire risk at a regional scale. Fire management requirements relating to Aboriginal sites, places and values, species or populations of species are addressed separately in documents such as nature conservation strategies, local area management plans, species recovery plans, and individual burn prescriptions.

The RFMP considers the hazard posed by bushfire to people, communities, infrastructure, and the natural environment. It is underpinned by the principle that managing the fuel available to bushfire is the most efficient and effective way to reduce the impacts of unplanned bushfire. This plan should be read in conjunction with the department's Bushfire Risk Management Framework which further describes this principle and bushfire risk management criteria.

Targets in the RFMP apply to land managed by the department and the tactics proposed are restricted to prescribed burning and physical fuel management such as scrub rolling. Other key aspects of managing bushfire-related risk (including preparation for, response to and recovery from bushfire) are not within the RFMP scope.

The RFMP will be reviewed annually, and a comprehensive review undertaken at the end of its five-year life at the beginning of 2031. Any important new information that emerges between reviews will be incorporated immediately and the plan re-endorsed if those changes are significant.

## 2. Bushfire risk criteria

### 2.1. Bushfire risk management zones

A bushfire risk management zone (BRMZ) is an area with similar environmental variables, land use and cultural conditions and therefore a similar characteristic risk profile. It is an area within which fuel management activities are guided by a single set of bushfire risk indicators. Western Australia's BRMZs are defined and described in the department's Bushfire Risk Management Framework.

The department's South Coast Region lies mainly within the Southern Coastal and Southern Rangelands BRMZ, with small portions of South West and Agricultural BRMZ on the western and northwestern edges of the region.

### 2.2. Fire management areas

The department divides the land it manages into six fire management areas (FMAs) to guide bushfire risk assessment and fuel management planning. These areas are defined according to the primary purpose of fuel management in the area and described relative to their proximity to assets.

The department's indicators of acceptable bushfire risk (defined in the department's Bushfire Risk Management Framework) allow fuel management activities to be tailored according to the risk profile and the management purpose of the land, including designating areas where there are no targets due to the limited capacity or requirement to manage fuels. The settlement-hazard separation (SHS), critical infrastructure buffer (CIB), critical transport corridor (CTC), agricultural interface (Agl), landscape risk reduction (LRR) and remote area management (RAM) categories are applied to the South Coast Region.

**Table 1: Fire management areas in the DBCA South Coast Region.** (Refer to the department's Bushfire Risk Management Framework for more information.)

Fire management area	Description
Settlement-hazard separation (SHS)	<ul style="list-style-type: none"><li>• An area of managed fuel adjacent to towns, subdivisions, and other areas of human settlement.</li><li>• Management objective is to reduce the likelihood of direct flame contact, damaging intensities of radiant heat and ember attack from posing a threat to people.</li><li>• Breadth of area considers the fuels, climate and topography of the area and the nature of the appropriate fuel management strategies.</li><li>• Fuels are managed relatively intensively to minimise the likelihood of a bushfire being sustained and to facilitate fire suppression.</li><li>• The use of fuel management to achieve other land management objectives is supported where it is complementary to the primary management intent.</li></ul>
Critical infrastructure buffer (CIB)	<ul style="list-style-type: none"><li>• An area of low fuel around items of critical infrastructure.</li><li>• Management intent and intensity of fuel management is similar to SHS, however the CIB will generally be applied to a less extensive area than the SHS due to these assets having a higher level of resilience to ember attack.</li></ul>

Fire management area	Description
	<ul style="list-style-type: none"> <li>• Only applies in BRMZs where the most appropriate strategy to protect critical infrastructure from bushfire is localised, rather than landscape scale fuel management.</li> </ul>
Critical transport corridor (CTC)	<ul style="list-style-type: none"> <li>• An area of low fuel adjacent to critical transport corridors.</li> <li>• Management objective is minimising the potential for disruption of critical transport between WA and the eastern states of Australia.</li> <li>• Fuels are managed to increase the arrival time of an approaching bushfire, improve suppression effectiveness and limit landscape scale spread of a bushfire that may endanger people, damage infrastructure, cause financial or social disruption, or threaten SHS or CIB FMAs.</li> </ul>
Agricultural interface (Agl)	<ul style="list-style-type: none"> <li>• An area of low fuel applied to large continuous areas of native vegetation that occur adjacent to agricultural land.</li> <li>• Management objective is to prevent large, intense bushfires entering agricultural land from native vegetation or vice versa.</li> <li>• Fuels are managed to prevent the occurrence of large bushfires that may endanger people, damage infrastructure, cause financial or social disruption, degrade the natural environment or threaten SHS or CIB FMAs.</li> </ul>
Landscape risk reduction (LRR)	<ul style="list-style-type: none"> <li>• Encompasses areas where the density or significance of infrastructure, economic activity or environmental assets necessitates fuel management at a landscape scale.</li> <li>• Fuel management will achieve a range of outcomes, including preventing the occurrence of large bushfires that may threaten life, damage infrastructure, cause financial or social impacts, degrade the natural environment, or threaten SHS or CIB fire management areas.</li> <li>• This is usually achieved by creating a mosaic of fuel ages to reduce the likelihood of fires igniting and spreading and provides greater opportunity for suppression.</li> </ul>
Remote area management (RAM)	<ul style="list-style-type: none"> <li>• Areas where remoteness, inaccessibility, resource constraints and a lack of consequential assets make it impractical or unnecessary to intervene in the prevailing fire regimes.</li> <li>• Fuel management activities are a lower priority but may still occur where required to achieve land management outcomes.</li> </ul>

The RFMP identifies where each FMA occurs in the region and details bushfire risk indicators for each fuel type within them. The effective management of bushfire risk in the South Coast Region requires complementary activities in the FMAs including SHS, CIB, CTC, Agl and LRR. These areas have differing management intents, but do not represent a hierarchy of priorities for fuel management.

### 2.3. Asset value

The department's Bushfire Risk Management Framework applies the National Emergency Risk Analysis Guidelines (NERAG) and the State Emergency Management Prevention and Mitigation

Procedure (SEMPMP) to group and prioritise assets at risk from bushfire. These priorities are used to define FMAs and guide the planning of mitigation activities.

**Table 2: Asset class categorisation and prioritisation used when assessing bushfire risk.**

Asset class	Priority	Description
Settlements	1	Areas of higher population density and low resilience to bushfire: <ul style="list-style-type: none"> <li>• settlements, towns, and subdivisions</li> <li>• recreation and camping sites with high fire-season visitation.</li> </ul>
Dispersed population	2	Areas of low or transient population density and low resilience to bushfire: <ul style="list-style-type: none"> <li>• individual dwellings</li> <li>• roads with high usage in fire-vulnerable areas</li> <li>• recreation and camping sites with moderate fire season visitation.</li> </ul>
Critical infrastructure	2	Locations where there is a considerable threat to critical infrastructure with State-level significance and no redundancy: <ul style="list-style-type: none"> <li>• major highways and other primary distributors</li> <li>• major rail routes</li> <li>• major infrastructure associated with electricity generation</li> <li>• gas transmission pipelines</li> <li>• water supply and pipelines and associated pumps and pumping stations</li> <li>• major optical TELCO cables</li> <li>• major wastewater treatment sites.</li> </ul>
Protected species and communities	2	Areas that are critical to the survival of a legislatively protected species or threatened ecological communities (TEC) with low resilience to fire.
Economic assets	3	Locations where bushfires may have a significant effect on the livelihood of individuals or community financial sustainability, such as: <ul style="list-style-type: none"> <li>• farmland</li> <li>• infrastructure of local and/or regional significance</li> <li>• major industry e.g. mine sites, refineries, manufacturing plants</li> <li>• plantation timber resources</li> <li>• water supply catchments.</li> </ul>
Other assets	3	Other significant built, natural, or cultural assets, such as: <ul style="list-style-type: none"> <li>• infrastructure of local significance</li> <li>• significant ecological communities or species habitat</li> <li>• areas with specific fire regime requirements</li> <li>• fire vulnerable Aboriginal or European heritage sites.</li> </ul>

## 2.4. Asset resilience

The likelihood that the potential consequences of a bushfire will be realised depends partly on the resilience of the asset to fire. It is difficult to model resilience given there are many variables that

affect the outcome of a fire, however some considerations for determining the resilience of an asset are shown in Table 3 (settlements) and Table 4 (biodiversity assets).

**Table 3: Factors affecting the resilience of settlements to bushfire.** Some of these factors are also applicable to other built assets and recreation sites.


<b>More resilient to fire</b>	<b>Less resilient to fire</b>
<b>Interface community<sup>1</sup></b>	Intermix community <sup>2</sup>
<b>Hardened urban area without vegetation</b>	Vegetation exists within developed area
<b>Multiple access routes</b>	One access route
<b>Access routes highly trafficable</b>	Access routes have limited trafficability
<b>Access routes protected by low fuel buffers</b>	Access routes have adjacent vegetation
<b>Surrounding vegetation is fragmented</b>	Surrounding vegetation is continuous
<b>Adequate refuge available (oval, beach etc.)</b>	Little refuge available
<b>Most residents are capable of self-evacuation</b>	Large population of elderly, infirm or children
<b>Local population well prepared for fire</b>	Population has low level of preparedness
<b>Adequate water supply</b>	Limited water available for fire fighting
<b>Most dwellings constructed of brick</b>	Dwellings constructed of timber or fibro
<b>Building APZs<sup>3</sup> well maintained</b>	Building APZs poorly maintained
<b>Permanent resident population</b>	Campsite or tourist/transient population

<sup>1</sup> An interface community is where a clear demarcation exists between urban areas and native vegetation and bushland does not continue into the developed area.

<sup>2</sup> An intermix community is where structures occur throughout a bushland area without a clear demarcation between urban and bushland areas.

<sup>3</sup> Asset protection zone: a low-fuel area maintained around a building to increase the likelihood that it will survive a bushfire.

**Table 4: Factors affecting the resilience of species, communities, and ecosystems to bushfire.**

**More resilient to fire**  **Less resilient to fire**

<b>Key plant species are resprouters</b>	Key plant species are obligate seeders
<b>No other threatening processes occurring</b>	Fire may exacerbate other threatening process
<b>Species have short juvenile periods</b>	Species have long juvenile periods
<b>Species have wide distributions</b>	Species have restricted distributions
<b>Species have multiple populations</b>	Species have few populations
<b>Connections exist between populations</b>	Populations are isolated
<b>Fauna is more mobile</b>	Fauna is less mobile
<b>Fauna is adapted to persistence in refugia</b>	Fauna has limited ability to persist in refugia
<b>Fauna can utilise a variety of habitats</b>	Fauna has specialised habitat requirements
<b>Habitat re-establishes rapidly post-fire</b>	Habitat slow to re-establish post-fire
<b>Fauna has a broad diet or can vary diet post-fire</b>	Fauna has specific dietary requirements
<b>Fire has little effect on predation rate</b>	Fauna vulnerable to post-fire predation
<b>Fauna has high rate of population increase</b>	Fauna has low rate of population increase

Asset resilience is combined with the asset class priority rating (Table 2) to provide a regional priority for each asset. This is done using the matrix in Table 5. The regional priority is recorded in Table 8 of the RFMP and will guide the programming of works to mitigate bushfire risk.

**Table 5: Matrix for determining the regional priority of assets in each class.** The asset class priority is shown in Table 2, and the asset resilience is set with guidance from the criteria in Table 3 and Table 4.

Asset class priority	Resilience		
	High	Medium	Low
1	3	2	1
2	4	3	2
3	5	4	3

## 2.5. Risk treatment strategies

The department applies two broad strategies for managing fuels to reduce bushfire risk:

1. Establishment and maintenance of low fuel areas close to assets or in strategic locations in order to interrupt a fire run. Low fuel areas may be established by prescribed burning or physical fuel modification.
2. Landscape-scale fuel management using prescribed burning to create a mosaic of fuel availability within which there is reduced potential for the development of large bushfires and increased opportunities for successful fire suppression.

These strategies are applied individually or in combination to achieve the fuel conditions required by the indicators of acceptable bushfire risk.

## 2.6. Tolerable fuel age

The tolerable fuel age is the maximum age at which fuel in an FMA is deemed to be in a managed state. It is defined as the age at which the fuel will burn with an intensity that is double the upper limit at which machine and tanker attack on the head fire is possible under 95<sup>th</sup> percentile fire danger index (FDI) weather conditions<sup>4</sup> (see Section 2.7). This is determined by using fuel accumulation and fire behaviour models for the appropriate fuel type. Where this period is unknown, an alternative figure of 1.5 times the minimum period required post-fire before the vegetation will again sustain a bushfire is used.

**Table 6: Maximum intensity and rate of spread thresholds for head fire attack on a bushfire.**

<b>Machine and tanker attack possible</b>	Intensity < 2000kW/m and/or ROS < 400m/hr in forest
	Intensity < 2000kW/m and/or ROS < 1000m/hr in shrubland
	Intensity < 5000kW/m and/or ROS < 6500m/hr in grassland

## 2.7. Weather conditions

When defining the range of each FMA and the tolerable age of fuels within it, the department's bushfire risk management criteria require the application of the conditions that produce the 95<sup>th</sup> percentile FDI in the area. Worse fire conditions than this would only be expected to occur approximately seven times per year.

The 95<sup>th</sup> percentile weather conditions have not been applied to the South Coast Region RFMP. Weather conditions derived from the Bureau of Meteorology weather reanalysis project were not considered to accurately reflect extreme fire conditions in the region. This is likely due to there being only five years' data currently available from the weather reanalysis project. Weather variables

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<sup>4</sup> The intensity values for machine and tanker attack are doubled because the thresholds in Table 6 relate to head fire intensity, while the department's usual approach to a direct attack on a bushfire is to begin from the tail fire and work along the flank to the head. This means that most of the suppression effort is undertaken on parts of the fire exhibiting much lower fire intensity than the head fire. Flank fire intensity may be up to four times lower than head fire intensity, but a more conservative two-fold factor is used to set the risk indicators.

considered to represent extreme fire weather conditions have been contributed by experienced DBCA fire staff. This will be reviewed as more data becomes available.

## 3. The South Coast Region

The South Coast Region consists of approximately 18 million hectares of land managed by the department along the south coast of Western Australia between the Hay River (near Denmark) in the west and the South Australian State border in the east. The region includes the major towns of Albany and Esperance, the regional centres of Mt Barker, Cranbrook, Jerramungup, Ravensthorpe and Hopetoun and many smaller settlements. There are eight local government authorities in the region.

### 3.1. Tenure and management arrangements

The region contains approximately 2.6 million hectares of CALM Act land consisting of 14 national parks, 173 nature reserves, six timber reserves and 43 other miscellaneous reserves. The department also has responsibility for fire management on 9.3 million hectares of unallocated Crown land (UCL) and unmanaged reserves (UMR) in the region.

### 3.2. Climate and vegetation

The climate of the region is Mediterranean with cool, wet winters and hot, dry summers. Rainfall decreases significantly with distance north from the coastline and from west to east. Temperatures are most extreme in inland areas and milder towards the coast.

The developed hinterland of Albany and Esperance contain many smaller reserves embedded in an agricultural landscape. There is less development in the northern and eastern parts of the region with large areas of contiguous vegetation. Vegetation nearer the coast consists of *Banksia* woodlands, sandplain shrubland and mallee-heaths. These vegetation types transition into semi-arid woodlands to the north (Great Western Woodlands) and *Acacia* woodlands and chenopod shrublands to the east (Nuytsland and Nullarbor).

Many of these areas, such as the Stirling Ranges NP, Fitzgerald River NP, Two Peoples Bay NR, Ravensthorpe ranges, Great Western Woodlands and the islands of the Recherché Archipelago contain biodiversity of international significance.

Significant areas of eucalypt plantation exist on farmland surrounding Albany and Esperance. Department-managed land is often close to these plantations.

### 3.3. Fire management considerations

The South Coast Region has very limited fire management capacity and shares significant lengths of boundary with private property and other bushfire risk owners. The department is committed to fire management partnerships with the Department of Fire and Emergency Services, local governments, and volunteer bush fire brigades for mutual aid in fire suppression and bushfire risk reduction. There are areas of exclusive and non-exclusive Native Title determination, and relationships with Traditional Owners need to be maintained to ensure continued partnerships to undertake mitigation and the protection of conservation values. The region features major arterial roads, rail lines and telecommunication infrastructure connecting Western Australia with states to the east. Power, water, and gas infrastructure that service millions of residents are located on or near department-managed lands. These factors make the mitigation of bushfire risk to the community of Western Australia

particularly important in this region. The water catchments that service the Albany area are also important natural areas that require fire management.

The region features several high visitation recreation sites, camping sites and trails in fire prone locations. Many of these locations are remote from fire suppression resources and response times are very prolonged (days).

Lightning and accidental ignitions are the dominant cause of fires in the region. Multiple ignitions commonly occur with the passage of active troughs during the fire season. The quantum and timeliness of response activities are challenging due to the numerous ignitions, limited resources available, limited access, and the large distances involved. Effective fire containment is heavily dependent on the utilisation of existing low fuel areas in the landscape such as lake systems and fire scars.

The region contains fauna and flora with a high degree of endemism. The region is an internationally recognised biodiversity hot spot and contains one of five UNESCO biodiversity reserves in Australia (Fitzgerald Biosphere) and several parks and reserves recognised nationally for their unique and highly diverse flora and fauna. Many of these species and communities are considered fire sensitive and are listed as threatened under State and federal legislation and are greatly reduced in extent with some at risk of extinction. Incorporating the needs of these species and communities into bushfire risk management activities is a significant consideration to minimise impacts.

A variety of lodged, registered and unregistered Aboriginal heritage sites and cultural landscapes exist in the region which can be adversely impacted by bushfire and prescribed burning activities. South Coast Region is commencing negotiation with Aboriginal people including indigenous land use agreements for the establishment of joint management agreements and cooperative management across DBCA managed lands and the Noongar Boodja Land Estate. To achieve appropriate fire management planning and operational outcomes, the department in collaboration with Aboriginal people will undertake thorough assessment of Aboriginal culture as part of its burn planning process and, where possible, develop and implement strategies to protect cultural values.

### 3.4. Key fuel management strategies

The primary objective of the department's fire management in the South Coast Region is to protect human life (people and communities) and important community infrastructure. The department also aims to manage fire in a way that promotes ecosystem health and avoids compounding the effects of other threatening processes.

To achieve these objectives, the department:

- uses prescribed burning to maintain a landscape-scale mosaic of fuel age and structure to inhibit the spread of bushfires, create opportunities for successful fire suppression, and maintain adequate habitat linkages to support biota
- uses prescribed burning to maintain a mosaic of fuel age and structure within reserves to reduce bushfire risk to and from surrounding lands and to support ecosystem resilience
- uses prescribed burning or other forms of fuel management to maintain areas of low-fuel adjacent to private property and important infrastructure
- applies prescribed fire to the landscape with consideration of ecosystems and the requirements of important species and ecological communities
- maintains physical fuel treatments such as vegetation modification in strategic locations.

Fuel management strategies applied across the South Coast Region focus on the application of prescribed burning at a landscape scale as well as within medium to large sized reserves to reduce bushfire risk to life and property, while promoting positive ecological outcomes. There is a significant focus within larger reserves such as Stirling Range NP, Fitzgerald River NP, and parks around Albany close to settlements, to establish and maintain an ecologically appropriate, fire induced mosaic of vegetation structure and fuel quantities capable of providing acceptable bushfire risk to neighbours. Some of these parks also contain physical vegetation treatments that strategically reduce the quantity of fuel available and provide a higher probability of successful bushfire suppression operations.

In the large areas of UCL north of Esperance a combination of physical fuel treatment along boundaries, strategic prescribed burning and strategic fire access is applied. In the more remote areas of the region, opportunistic fire management operations are applied as and when appropriate and feasible.

The application of prescribed burning is not appropriate or practical in some reserves within the region and other forms of physical fuel management, or no treatment at all, may be more appropriate. Examples of these locations are reserves with high conservation value and low resilience to fire, single small (<500 hectares) or linear (<500 metres in width) reserves embedded in an agricultural landscape or vegetation types that may not burn under prescribed burning conditions. The maintenance of appropriate landscape scale fuel mosaics is important to address fuel age distribution across the landscape and reduce risk to these important reserves and surrounding assets.<sup>5</sup>

Specific to the Southern Rangelands BRMZ, the following objectives and strategies were developed to help inform the identification of fire management areas in this zone.

#### Objectives:

1. Protect life and property
2. Prevent the occurrence of landscape-scale bushfires (>30,000ha)
3. Mitigate the likelihood of bushfires crossing the agricultural interface in either direction
4. Mitigate the likelihood of bushfires impacting critical transport corridors and critical infrastructure
5. Protect regenerating fire-sensitive eucalypt woodlands from bushfire prior to reaching reproductive maturity (25-30 years old)
6. Protect mature fire-sensitive eucalypt woodlands from bushfire (which may burn under extreme fire conditions)
7. Protect other fire-sensitive species and communities from bushfires

#### Strategies (in indicative priority order)

1. Mitigate risk along the agricultural interface and the major transport corridors through prescribed burning and the creation of low fuel buffers (up to 100m deep) in non-woodland fuels using mechanical treatments - chaining every 7-12 years, chopper-rolling 5-7 years and mulching 4-6 years

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<sup>5</sup> The term "fuel" in the South Coast RFMP refers to treatable fuels and recognises that the application of prescribed burning is not appropriate or practical in some areas.

2. Application of prescribed burning to achieve 45 per cent of the landscape within 10km of the agricultural interface less than tolerable fuel age to all non-woodland fuels
3. Create and maintain landscape barriers to prevent spread of bushfires by joining areas of low fuel (eg. lake systems and fire scars) with additional prescribed burning. Treatment target is 60 per cent of fuel below tolerable age threshold and applies to all non-woodland fuels
4. At a landscape scale, create a mosaic of fuel ages. This could include open-edged prescribed burns and bushfires. Treatment target is 30 per cent of fuel below tolerable age threshold and applies to all non-woodland fuel types
5. Within the context of the strategies 2-4 above, consider the treatment of fuel types that exceed their tolerable fuel age threshold where these occur within 500 metres of woodlands, prioritising i) regenerating and ii) mature woodlands, and iii) any other communities identified as bushfire sensitive. Treatment target is 60 per cent of fuel below threshold age and applies to all non-woodland fuel types

## 4. South Coast Region risk criteria

The South Coast Region lies within the Midwest, South Coastal, Southern Rangelands, Southwest and Agricultural BRMZs. The indicators of acceptable bushfire risk are based upon the fuel and fire behaviour characteristics of sandplain shrubland (west and east), thicket (inland and coastal), mallee-heath (inland and coastal), dry eucalypt forest and wet eucalypt forest which have been broadly grouped across the region.

**Table 7: Summary of bushfire risk criteria for the South Coast Region.**

Fuel type	Dry eucalypt forest	Wet eucalypt forest	Sandplain shrubland (west)	Sandplain shrubland (east)
Fuel accumulation and fire behaviour models	Forest fire behaviour tables (Redbook) Dry eucalypt forest fire model (VESTA)	Forest fire behaviour tables (redbook) Dry eucalypt forest fire model (VESTA)	Expert judgement Anderson shrubland model	Expert judgement Anderson shrubland model
Weather parameters applied	Location: Redmond Temperature: 30 Relative humidity: 20% Wind speed: 20km/h	Location: Porongurup Temperature: 30 Relative humidity: 20% Wind speed: 20km/h	Location: Torndirrup NP Temperature: 30 Relative humidity: 15% Wind speed: 20km/h	Location: Cape Le Grande Temperature: 35°C Relative humidity: 15% Wind speed: 30km/h
Tolerable fuel age	6 years	8 years	6 years	9 years
Settlement-hazard separation (SHS)	5000m surrounding settlements	5000m surrounding settlements	1000m Surrounding settlements	1000m Surrounding settlements
Critical infrastructure buffer (CIB)	N/A	N/A	100m surrounding critical infrastructure	100m surrounding critical infrastructure
Landscape risk reduction (LRR)	As defined in Table 8	As defined in Table 8	As defined in Table 8	As defined in Table 8
Critical transport corridor (CTC)	15km each side of National Highway 1	15km each side of National Highway 1	15km each side of National Highway	15km each side of National Highway 1
Agricultural Interface (Agl)	10km into native vegetation from the clearing line	10km into native vegetation from the clearing line	10km into native vegetation from the clearing line	10km into native vegetation from the clearing line
Remote area management (RAM)	N/A	N/A	N/A	Eastern part of Southern Rangelands BRMZ

**Table 7: Summary of bushfire risk criteria for the South Coast Region.**

<b>Fuel type</b>	<b>Mallee heath (coastal)*</b>	<b>Mallee heath (inland)</b>	<b>Thicket (inland)</b>	<b>Thicket (coastal)</b>
Fuel accumulation and fire behaviour models	Expert judgement Cruz mallee-heath model	Expert judgement Cruz mallee-heath model	Expert Judgement Anderson shrubland model	Expert judgement Anderson shrubland model
Weather parameters applied	Location: Fitzgerald River NP (Coastal) Temperature: 35 Relative humidity: 15% Wind speed: 25 km/h	Location: Ravensthorpe Temperature: 38 Relative humidity: 10% Wind speed: 25 km/h	Location: Norseman Temperature: 35°C Relative humidity: 10% Wind speed: 35 km/h	Location: Torndirrup NP Temperature: 30 Relative humidity: 15% Wind speed: 20 km/h
Tolerable fuel age	8 years	18 years	15 years	6 years
Settlement hazard separation (SHS)	500m surrounding settlements	500m surrounding settlements	1000m surrounding settlements	1000m surrounding settlements
Critical infrastructure buffer (CIB)	100m surrounding critical infrastructure	100m surrounding critical infrastructure	100m surrounding critical infrastructure	100m surrounding critical infrastructure
Landscape risk reduction (LRR)	15km each side of National Highway 1	15km each side of National Highway 1	15km each side of National Highway	15km each side of National Highway 1
Critical transport corridor (CTC)	10km into native vegetation from the clearing line	10km into native vegetation from the clearing line	10km into native vegetation from the clearing line	10km into native vegetation from the clearing line
Agricultural Interface (Agl)	As defined in Table 8	As defined in Table 8	As defined in Table 8	As defined in Table 8
Remote area management (RAM)	N/A	East of Esperance to SA border	N/A	East of Esperance to SA border

\* Also includes a small portion of Banksia woodland near Bremer Bay

\*\* Small occurrence of hummock grassland Norseman treated as thicket (Inland)

\*\*\*Plantation (Helms Arboretum) treated as dry eucalypt

## 5. Asset categorisation and prioritisation

The following table applies the department's bushfire risk criteria to identify and prioritise assets in the South Coast Region, establishing where each FMA applies. Table 9 then provides the indicators of acceptable bushfire risk for these areas.

**Table 8: Asset categorisation and prioritisation for the South Coast Region.**

Fire area	management	Asset class	Asset description and occurrences	Resilience	Rationale
<b>Regional priority 1</b>					
<b>SHS</b>		Settlements	Mira Flores, Whale World, Cheynes Beach, Nullaki, Little Grove, Torbay Hill, Redmond, Point Henry, Goode Beach, Stony Creek Subdivision, Kalgan, Narrikup, Porongurup, Gibson, Grasspatch, Madura, Condingup, Eucla, Munglinup, Lowlands, Big Grove, Kalgan River, Manypeaks, Tenterden, Boxwood Hill, Wellstead, Borden, Youngs Siding, Bremer Bay, Norseman, Ongerup, Salmon Gums, Cranbrook, Scadden, Torbay and Hopetoun	Low	These settlements have been assessed against each criterion of Table 3: Factors affecting the resilience of settlements to bushfire. This has allowed a consistent assessment of each site. A rating for each was applied and calculated to give an average.
			Torbay Inlet Campsite (R), Cape Riche (R.), Granite Skywalk (R.), Cosy Corner Campsite (R.), Wharton Bay (R), Le Grande Campsite (R), Lucky Bay Campsite (R), The Gap (R)	Low	These campsites and recreation facilities have been assessed against each criterion of Table 3: Factors affecting the resilience of settlements to bushfire, that are applicable for this type of development. This has allowed a consistent assessment of each site. A rating for each was applied and calculated to give an average, where a criterion is not applicable a 0 is allocated that does not affect the scoring.
<b>Regional priority 2</b>					
<b>SHS</b>		Settlements	Elleker, Millbrook, Lower King, Bayonet Head, Mount Barker, Ravensthorpe, Albany, Albany Prison, Esperance	Medium	These settlements have been assessed against each criterion of Table 3: Factors affecting the resilience of settlements to bushfire. This has allowed a consistent assessment of each site. A rating for each was applied and calculated to give an average.
<b>CTC</b>		Critical infrastructure Dispersed population Economic assets	National Highway 1	Medium	Maintenance of the flow of people, goods and services is of national significance with no redundancy.
<b>AgI</b>		Dispersed population Economic assets Protected species and communities	Agricultural Interface extends 10km into native vegetation from the clearing line	Medium	Protection of agricultural property, produce and associated infrastructure, individual livelihood and community sustainability, areas of smaller or transient population, recreation sites and environmental assets.
<b>LRR</b>		Dispersed population Economic assets Protected species and communities Critical Infrastructure Other assets	All lands within the Albany District and all lands within the Esperance district (excluding islands) west of the eastern most occurrence of the Agricultural Interface and south of the greater western woodlands	Medium	This area contains a concentration of assets, including individual dwellings, travelling public, recreation infrastructure, biodiversity values, cultural heritage, and economic assets. Formal and informal camping activities are popular, especially near the coast.

Fire area	management	Asset class	Asset description and occurrences	Resilience	Rationale
		Dispersed population	West Cape Howe Bib Tr Hut, Torbay Bib Tr Hut, Hidden Valley Bib Tr Hut, Sandpatch Bib Tr Hut, Stoney Hill, Whalebone Hut, Muttonbird Bib Track Hut, Twertup, Skippy Rock, Mount Ragged Campsite, Peak Charles Campsite, St Marys Campsite, Sharp Point, Eyre Bird Observatory, Fanny Cove, Shoal Cape, Four Mile Camp Ground, Bellinup (Stokes), Israelite Bay - Cape Arid, Shelley Beach, Frenchmen's Peak, Millers Point, Pallinup, Bettys Beach, Thomas River - Cape Arid, Blow Holes, Jimmy Newells, Tree in the Rock, Castle Rock- Day Use, Rossiter Bay, Eyre Hwy, Coolgardie-Esperance Hwy, Stokes Campsite, Stirling Range Retreat, Salmon Holes, Ledge Beach, Boiler Bay, Hellfire Bay, Normans Beach, Eastern Beach, Point Anne (Day use), Waychinicup Campsite, Hamersley Campsite, Misery Beach, South Coast Hwy, Albany Highway, Quaalup, Dunn Rock Camp Ground, Two Peoples Bay, Moingup Springs, Mt Trio Caravan Park, Rangers Base East Mt Barren, Rangers Base Murray Rd and Rangers Base -Jacup	Low	These sites of smaller or transient populations (Dispersed Populations) have been assessed against each criterion of Table 3: Factors affecting the resilience of settlements to bushfire, that are applicable for this type of asset class. This has allowed a consistent assessment of each site. A rating for each was applied and calculated to give an average, where a criterion is not applicable a 0 is allocated that does not affect the scoring.
		Protected species and communities	Albany Management Zone included Two Peoples Bay, Mount Manypeaks, Waychinicup and Bald Island Threatened flora and fauna species, suitable habitat and translocation areas Montane Vegetation (Stirling Range, Barren Range, Russell Range), and other threatened ecological communities (eg Peat) South Coast significant wetland (includes RAMSAR, wetlands of national and regional significance)	Low	High number of threatened species of flora and fauna and identified in the South Coast Threatened Species Strategic Management Plan. Areas of significant research and translocation populations with considerable financial investment. Translocation populations and isolated remnant populations. Areas of significant research and translocation populations with considerable financial investment. Wetlands of international significance for waterbird breeding, small recreation facility associated.
<b>Regional priority 3</b>					
LRR		Dispersed population Economic assets Protected species and communities Critical infrastructure Other assets	Great Western Woodlands as defined by the "Great Western Woodlands" shapefile within DBCAs Corporate Data Distribution Program	Medium	The Great Western Woodlands is an internationally significant area containing an accumulation of important assets including threatened species, cultural heritage, mining, recreation, and tourism. It also contains critical and regionally significant transport corridors and areas of agricultural interface.
		Protected species and communities	Fire Sensitive Species and Ecosystems Listing of South Coast identified with a Medium Resilience	Medium	South Coast Fire Ecology Report assessed and identified threatened species sensitive to inappropriate fire regimes. Noting more current information may be available for some species and not included in this 2009 assessment.
<b>Regional priority 4</b>					
LRR		Economic assets	Several large mine sites and associated infrastructure, includes Esperance Power, Albany - Willyung / Holcim, Mt Cattlin - Dowling Open pit, Esperance / Holcim, Mt Malcolm - Verde Austral, Elverdton Dumps, Merivale - Mt Edward, Hale-Bopp, Ravensthorpe Group, Ravensthorpe Aggregate / BGC, Albany Monumental Masons Plant	Medium	These sites of Economic Assets have been assessed against each criterion of Table 3: Factors affecting the resilience of settlements to bushfire, that are applicable for this type of asset class. This has allowed a consistent assessment of each site. A rating for each was applied and calculated to give an average, where a criterion is not applicable a 0 is allocated that does not affect the scoring.

Fire management area	Asset class	Asset description and occurrences	Resilience	Rationale
<b>Regional priority 5</b>				
<b>LRR</b>	Other assets	Stockyard Creek, Maggie Hays Ethnographic, Young River, Oldfield River, Lort River, Mt Cattlin, Ravensthorpe Cermonial, Mt Cattlin 4, Cattlin Creek, Marbellup Brook, Jerdacuttup River, Kalgan River, Kepwari West Creek, Dalyup River, Kepwari Dunes.	High	Assets could be damaged by high intensity fire impact, or by fire suppression operations.
		Esperance Airport, Fraser Range - Garnet Ice, Mindijup Processing Plant, Nova - Bollinger Underground, Lake Tay Production Group, Woodward WRD, Upper Kalgan Ads, Beaumont East Gypsum, Sinclair Cesium Zone, Ravensthorpe Nickel Mine, Phoenix Plant, Halleys Mine, Bandalup Magnesite N2 West, Central Norseman Valley TSF4, Galaxy Lithium Mine, Princess Royal Mine, Harbour View Mine, Albany Port	High	These sites of Economic Assets have been assessed against each criterion of Table 3: Factors affecting the resilience of settlements to bushfire, that are applicable for this type of asset class. This has allowed a consistent assessment of each site.

## 6. Indicators of acceptable bushfire risk

Bushfire risk is maintained at an acceptable level in the South Coast Region if fuels are managed to the condition described in the below table. The current landscape condition will be compared to these indicators at least annually and the outcomes of that comparison used to inform the development of the annual fuel management program.

**Table 9: Summary of indicators of acceptable bushfire risk in the South Coast Region.**

Fire management area	Fuel type	Location	Target
Settlement-hazard separation (SHS)	Dry eucalypt forest Wet eucalypt forest	5km surrounding settlements	60% of fuel less than threshold intensity
	Sandplain shrubland, thicket	1km surrounding settlements	
	Mallee-heath	500m surrounding settlements	
	Semi-arid woodland	N/A	No targets apply
Critical infrastructure buffer (CIB)	Sandplain shrubland, thicket, mallee-heath, dry eucalypt forest, wet eucalypt forest	100m surrounding critical infrastructure	50% of fuel less than threshold intensity
	Semi-arid woodland	N/A	No targets apply
Critical transport corridor	Sandplain shrubland, thicket, mallee-heath	15km adjacent to National Highway 94 from Yellowdine to Norseman and National Highway 1 from Norseman to Eucla	45% of fuel less than threshold intensity
	Semi-arid woodland	N/A	No targets apply
Agricultural interface	Sandplain shrubland, thicket, mallee-heath	10km along the 'clearing line' in continuous native vegetation where it intersects with cleared agricultural land	45% of fuel less than threshold intensity
	Semi-arid woodland	N/A	No targets apply
Landscape risk reduction (LRR)	Dry eucalypt forest	As defined in Table 8	45% of fuel less than threshold intensity
	Sandplain shrubland, mallee-heath, thicket	As defined in Table 8	30% of fuel less than threshold intensity
	Semi-arid woodland	N/A	No targets apply. Managed as required to meet land

Fire management area	Fuel type	Location	Target
			management objectives.
Remote area management (RAM)	Sandplain shrubland, thicket, mallee-heath, semi-arid woodland	All other Parks and Wildlife Service managed lands	No targets apply. Managed as required to meet land management objectives.

## 7. Spatial data

The descriptions of asset locations and FMA extents in Tables 8 and 9 are depicted spatially in a geodatabase that supports this RFMP. These data form the basis for comparison of the current landscape condition against the department's indicators of acceptable bushfire risk. This comparison will be conducted annually, at a minimum, and used to inform the fuel management program planning process. The master copy of the geodatabase is maintained in-house by the department's Regional Leader Fire Management with a copy provided to Fire Management Services Branch (FMSB) information officers to facilitate corporate reporting.

## 8. Monitoring and review

This plan will be regularly monitored and reviewed to ensure content remains accurate and up to date. The plan will be endorsed annually by the content custodian prior to being used in the burn program planning process.

FMSB will advise the South Coast Regional Manager of any changes to the department's Bushfire Risk Management Framework that will need to be reflected in the RFMP.

The Regional Manager, or their delegate, will review the regional context statement, regional risk criteria and asset categorisation and prioritisation annually (at a minimum). The most important aspect of this review is confirmation that Table 8 continues to represent a comprehensive and accurate catalogue of the assets in the region requiring protection from bushfire. Any changes to Table 8 will also be reflected in the accompanying spatial data, including the mapping of FMA extents.

The spatial data that supports the RFMP will be reviewed at least annually to capture any changes in the distribution of assets, fuel, or department-managed tenure. Updated datasets will be provided to FMSB whenever any changes are made.

## 9. Knowledge gaps

The department's risk criteria and indicators of acceptable risk were developed using the best available science, practitioner judgement and supporting data. These inputs will be monitored by the department to ensure that the RFMP continues to reflect industry best-practice. It is expected that ongoing adjustment to the settings will be required as the State's social, political and natural environments change, better data become available, or knowledge of bushfire risk management is refined or improved. The framework will also be updated to incorporate the findings of any relevant research or adaptive management, and as new models are developed and refined.



Department of **Biodiversity,  
Conservation and Attractions**