



SOUTH WEST REGION REGIONAL FUEL MANAGEMENT PLAN



Department of **Biodiversity,
Conservation and Attractions**



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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 West 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 West Region lies within the South West BRMZ.

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) and landscape risk reduction (LRR) categories are applied to the South West Region.

Table 1: Fire management areas in the DBCA South West 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"> • An area of managed fuel adjacent to towns, subdivisions, and other areas of human settlement. • 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. • Breadth of area considers the fuels, climate and topography of the area and the nature of the appropriate fuel management strategies. • Fuels are managed relatively intensively to minimise the likelihood of a bushfire being sustained and to facilitate fire suppression. • The use of fuel management to achieve other land management objectives is supported where it is complementary to the primary management intent.
Landscape risk reduction (LRR)	<ul style="list-style-type: none"> • Encompasses areas where the density or significance of infrastructure, economic activity or environmental assets necessitates fuel management at a landscape scale. • 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. • 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.

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 West Region requires complementary activities in the FMAs including SHS 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"> • settlements, towns, and subdivisions • recreation and camping sites with high fire-season visitation.
Dispersed population	2	Areas of low or transient population density and low resilience to bushfire: <ul style="list-style-type: none"> • individual dwellings • roads with high usage in fire-vulnerable areas • recreation and camping sites with moderate fire-season visitation.
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"> • major highways and other primary distributors • major rail routes • major infrastructure associated with electricity generation • gas transmission pipelines • water supply and pipelines and associated pumps and pumping stations • major optical TELCO cables • major wastewater treatment sites.
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"> • farmland • infrastructure of local and/or regional significance • major industry e.g. mine sites, refineries, manufacturing plants • plantation timber resources • water supply catchments.
Other assets	3	Other significant built, natural, or cultural assets, such as: <ul style="list-style-type: none"> • infrastructure of local significance • significant ecological communities or species habitat • areas with specific fire regime requirements • fire vulnerable Aboriginal or European heritage sites.

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.


More resilient to fire	Less resilient to fire
Interface community¹	Intermix community ²
Hardened urban area without vegetation	Vegetation exists within developed area
Multiple access routes	One access route
Access routes highly trafficable	Access routes have limited trafficability
Access routes protected by low fuel buffers	Access routes have adjacent vegetation
Surrounding vegetation is fragmented	Surrounding vegetation is continuous
Adequate refuge available (oval, beach etc.)	Little refuge available
Most residents are capable of self-evacuation	Large population of elderly, infirm or children
Local population well prepared for fire	Population has low level of preparedness
Adequate water supply	Limited water available for fire fighting
Most dwellings constructed of brick	Dwellings constructed of timber or fibro
Building APZs³ well maintained	Building APZs poorly maintained
Permanent resident population	Campsite or tourist/transient population

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

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

³ 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**

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

Machine and tanker attack possible	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 95th percentile FDI in the area. Worse fire conditions than this would only be expected to occur approximately seven times per year.

The 95th percentile weather conditions have not been applied to the South West 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 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 West Region

The South West Region covers approximately 1.8 million hectares in the far southwest corner of the State. The northern boundary lies between Bunbury and Mandurah with Augusta and Bridgetown the southern extent and Darkan and Boyup Brook near the region's eastern and southeastern extents respectively. The region covers all or part of thirteen local government areas (LGAs) and three Department of Fire and Emergency Services (DFES) regions. The largest population centres are Bunbury and Busselton. There are a number of smaller towns, settlements and individual dwellings throughout the region.

3.1. Tenure and management arrangements

The department manages approximately 795,000 hectares of land (approximately 45 per cent of the region) across a range of tenure types and has fire management responsibility for mitigation and bushfire response on the land within its jurisdiction.

Land use within the South West Region ranges from mixed agriculture land dominated by grazing in coastal parts, interspersed with towns, cities and other built up areas. There is significant State-wide power generation and distribution infrastructure in vicinity of Collie, major agricultural land uses include dairy farming, fruit farming, market gardening, forestry (native and plantation) and viticulture in the wetter west and cereal & sheep farming in the east. Mining has a significant presence, with resources ranging from bauxite, coal, lithium, gold and mineral sands. The department also manages some of the State's highest biodiversity values and premier tourism & outdoor recreation destinations located in fire prone environments.

3.2. Climate and vegetation

The South West Region experiences a Mediterranean climate characterised by a cool wet winter and a hot dry summer with moderately reliable rainfall.

Average annual rainfall within the region ranges from about 600mm in the east to 1200mm in the south. Most of this rainfall occurs in the winter months and summer drought is common.

During summer, the weather cycle is predictable and consists of a high-pressure system ridging into the Great Australian Bight from the west. As the high-pressure system moves eastward, winds swing from southerly to easterly to northerly. Winds from the south are usually cooler and may carry some moisture. Winds from the east and north are typically hot and dry. A trough regularly forms on the west side of the high-pressure system and precedes the next high-pressure system that will move across the southwest of the State. Hot gusty winds are from the north initially but switch rapidly to cooler moister southerlies as the trough moves eastward. There may be thunderstorm activity in association with the eastern side of the trough. These storms may produce lightning but little rain. Sometimes, these trough lines are associated with mid-level disturbances that can result in thunderstorms. These trough lines can also interact with moist tropical air from cyclonic systems moving southward along the north-west coast. This can result in thunderstorms and strong winds.

During summer, diurnal fluctuation in wind direction is common. Easterly wind gradients overnight are common associated with katabatic drainage and can be assisted or hindered by synoptic winds. Onshore winds are common in the afternoon near the coast and are intensified or nullified by the strength and direction of synoptic winds. This sea breeze does not usually penetrate much further inland than the Darling Scarp.

Winter weather patterns are associated with the passage of low-pressure systems to the south of the State separated by cold fronts. The extent to which these cold fronts penetrate northward significantly affects the timing and amount of rainfall over the region.

Climate change is evident in the decline in total annual rainfall, reduction in intensity and duration of rainfall events over the past three decades.

The South West Region covers a major proportion of the northern and southern jarrah forest (JF1 and JF2) biogeographic subregions, with southern parts of the Perth subregion and northern parts of the Warren bioregion also included.

Although the South West Region is relatively small in area (1,713,000 hectares or approximately 0.65 per cent of Western Australia), it is biogeographically diverse and contains two of the nationally defined terrestrial biodiversity hotspots (Busselton-Augusta and part of the Avon Wheatbelt). The region is botanically rich, with 15 beard vegetation mapping units, 54 regional forest agreement (RFA) vegetation complexes having been described, and approximately 3300 flora taxa recorded. High levels of diversity and endemism are present on the Swan Coastal Plain, Blackwood Plateau, Leeuwin Block and Scott Plain landforms.

3.3. Fire management considerations

The South West Region is relatively developed by Western Australian standards. It contains many townsites and smaller residential or tourism developments. The ability to live in a natural setting is a major attraction to both residents and tourists, meaning that many of these developments are situated in relatively fire-prone locations. An extensive network of roads, powerlines, telecommunication infrastructure and gas and water pipelines connect the region's population centres. Some of these are of State-wide significance, such as the power generation and distribution infrastructure in the vicinity of Collie. Collie currently produces much of the State's electricity, so any disruption to this supply has far reaching implications.

The Blackwood District is complex to manage because it represents a broad spectrum of socio-political and socio-economic demographics of society. It ranges from the Wheatbelt in the east to the Leeuwin-Naturaliste Ridge in the west. This complexity is further exacerbated by the rapid growth of urban centres into increasingly high bushfire risk rural urban interface surroundings; many cultural flora and fauna values, a large influx of seasonal tourists and national parks estimated to have more than 3.5 million visitors each year. It also has many agricultural and viticultural industries with significant global branding in a highly political landscape.

Fire is a natural feature of the South West Region. The vegetation and climate of the region lend themselves to the propagation of regular fires. Early records of European-managed fire date from the late 1930s, though it is not known how comprehensive these records are. The fire regimes of the 1930s through to the early 1960s were characterised by the occurrence of high numbers of large bushfires. From the late 1950s, the region's prescribed burning program increased markedly, with a corresponding decrease in the area burned by bushfires. At its peak, the region was prescribed burning up to 160,000 hectares per year and, at this time, bushfires would routinely affect less than 1000 hectares of land annually. Various constraints have resulted in a steady decline in prescribed burning activity since the beginning of the 1970s. In the last decade, the norm has been 30,000 to 50,000 hectares of prescribed burning in the region per year. This has resulted in increasingly large areas of older fuels and there is some evidence that the area burned in bushfires is again beginning to trend upwards. It is worth noting that the total number of bushfires has remained fairly consistent

since the 1950s, meaning that decreases in the total area burned by bushfire are related to fires being smaller in size, rather than fewer in number. This is probably a function of both the effectiveness of the prescribed burning program and improvements in suppression capacity. Fires caused by humans (arson or accidental) make up the majority of fires in the South West. However, most of the significant sized fires in recent times (Lower Hotham and Waroona) have been started by lightning and maintained by the associated severe weather.

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. To achieve appropriate fire management planning and operational outcomes, the department 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.

Forest enhancement areas that are planned to be or have been silviculturally treated by ecological thinning for forest health and resilience may require specific fire management applications. Consultation with the Forest Management Branch will be required to coordinate ecological thinning operations and prescribed burn planning to meet forest health objectives.

3.4. Key fuel management strategies

The primary objective of the department's fire management in the South West 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.

There are areas within the South West BRMZ where applying some or any form of prescribed burning is not appropriate. This could be for a variety of reasons including practicality, cost, the risks associated with applying prescribed fire outweighs the benefits achieved, or other conditions need to be met before burning can be an option. Other fuel management options need to be considered to mitigate risk. Some 'fuels' are also not conducive to management for reasons such as isolation, conditions required to undertake treatments, or the number of values in there are too high.

Locations or areas where some forms of fuel management are not appropriate or practical include (but are not limited to):

- Elevated levels of fuel on department managed land and private property adjacent to settlements is potentially considered a too high a risk to conduct prescribed burning in some areas. These include:

- Significant sections along the Leeuwin-Naturaliste ridge including Yallingup townsite (also karst issues with mechanical modification in surrounding fuels)
- Coastal dunes in the Kalgulup Regional Park
- Augusta townsite due to limited access to coastal ridge and multiple fuel types
- Assorted smaller sub-divisions throughout the region.

The complexity of fuel management in these areas is often further compounded by tenure (ownership of fuel).

- Bauxite mining rehabilitation forests should not be burnt for approximately 15 years post re-establishment and are deliberately excluded from prescribed burning for this period. However, whilst at 0-7 years, they can provide a moderate level of fire protection to surrounding areas due to lack of surface and trash fuels. There are similar issues associated with rehabilitation following coal mining in the Collie coal basin.
- Pine plantations in the region are primarily *Pinus radiata* which is a fire sensitive species. Therefore, burning under these pines is highly unlikely and the districts will need to work with plantation owners to determine a fuel management method that meets the 500m SHS recommendation. McLarty and Myalup plantations on the Swan Coastal Plain contain a mix of *P. radiata* and *P. pinaster* stands. Some areas of *P. pinaster* in these plantations are under-pine burnt.
- Conditional burn areas (CBAs) are areas that require specific fire regimes to support some management or research activity. The types of CBAs are currently under review. There are currently only three that have an official status; fire exclusion reference areas, scientific study areas, and no planned burn – management plan. The CBAs are being reviewed as part of the broader prescribed burn system review.

4. South West Region risk criteria

The South West Region lies within the South West BRMZ. The indicators of acceptable bushfire risk are based upon the fuel and fire behaviour characteristics of dry eucalypt forest, pine plantation, sandplain shrubland, wet eucalypt forest and *Banksia* woodland, which have been broadly grouped across the region.

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

Fuel type	Dry eucalypt forest	<i>P. pinaster</i> plantation	Sandplain shrubland	Wet eucalypt forest	<i>Banksia</i> woodland
Fuel accumulation and fire behaviour models	Forest fire behaviour tables (redbook) & dry eucalypt forest fire model (VESTA)	Forest fire behaviour tables (Redbook)	Expert judgement Anderson shrubland model	Forest fire behaviour tables (Redbook) & Dry eucalypt forest fire model (VESTA)	Dry eucalypt forest fire model (VESTA)
Weather parameters applied	Location: Collie Temperature: 38°C Relative humidity: 20% Wind speed: 3 km/h	Location: Bridgetown Temperature: 38°C Relative humidity: 20% Wind speed: 30km/h	Location: Dunsborough Temperature: 35°C Relative humidity: 25% Wind speed: 25km/h	Location: Witchcliffe Temperature: 35°C Relative humidity: 25% Wind speed: 25km/h	Location: Bunbury Temperature: 38°C Relative humidity: 20% Wind speed: 30km/h
Tolerable fuel age	<800mm isohyet 8 years >800mm isohyet 6 years	NA	9 years	8 years	9 years
Settlement-hazard separation (SHS)	5km surrounding fire vulnerable towns, settlements, subdivisions and camping areas.	500m surrounding fire vulnerable towns, settlements, subdivisions and camping areas.	1km surrounding fire vulnerable towns, settlements, subdivisions and camping areas.	5km surrounding fire vulnerable towns, settlements, subdivisions and camping areas.	1km surrounding fire vulnerable towns, settlements, subdivisions and camping areas.
Landscape risk reduction (LRR)	Remainder of South West BRMZ	5km surrounding property, individual livelihood, community sustainability, and environmental assets	1km surrounding property, individual livelihood, community sustainability, and environmental assets	Remainder of South West BRMZ	5km surrounding property, individual livelihood, community sustainability, and environmental assets
Fuels included in this fuel type – local rule set	Jarrah, wandoo, tuart, bluegum plantation, thicket	<i>P. radiata</i>	Coastal heath, peppermint, <i>Acacia</i> woodland	Karri	

5. Asset categorisation and prioritisation

The following table applies the department's bushfire risk criteria to identify and prioritise assets in the South West 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 West Region.

Fire area	management	Asset class	Asset description and occurrences	Resilience	Rationale
Regional priority 1					
SHS		Settlements	Bunkers Bay, Gracetown, Hamelin Bay, Myalup, Prevelly, Wyadup (Injidup), Yallingup	Low	Surrounded by continuous coastal shrubland fuels, one access route, high proportion of non-resident population, limited water available for firefighting and many dwellings with very little distance between the vegetation interface.
			Boranup, Hester, Jalbarragup, Jarrahwood, Kemerton Houses, Kirup, Kulikup, Mungalup, Myalup, Noggerup	Low	Townsite/community surrounded by forest fuels, usually contains many older, timber structures. Fuel loads vary from low jarrah/banksia through to heavy jarrah forest fuels.
			Commonage, Calkarri Rise, Colyer Subdivision, Molloy Island, Wilderness/Redgate	Low	Residential subdivisions (>1ha blocks) in a forested area often with one access route, internal cul-de-sacs, limited water available for firefighting and many dwellings with very little distance between the vegetation interface.
			East Augusta	Low	Small coastal town, large number of homes/holiday houses, high fire season visitation, limited access and surrounded by sandplain shrubland and some wet eucalypt forest.
			Honeymoon Pool, Jarrahdene, Potters Gorge, Stockton Lake, Lake Kepwari, Logue Brook	Low	These recreation sites are surrounded by forest fuels, with little access options. Fuel loads vary. Honeymoon Pool at base of steep slopes.
Regional priority 2					
SHS		Settlements	Barrabup, Collie-Burn, Collie-Cardiff, Kirup, Mungalup, North Greenbushes, Wilga	Medium	Mixed forest/agricultural zone surrounding town, some timber structures and forested corridors leading into the townsite. Multiple highly trafficable access routes.
			Margaret River	Medium	Inland town with significant resident population that has high visitation during the fire season, mixed agricultural and large pockets of old fuels in dry eucalypt forest contained within the town and on its outskirts.
			Binningup, Peppermint Beach, Smith's Beach	Medium	Coastal towns with significant resident population that have high visitation during the fire season, and forested corridors leading into the townsite.
			Leschenault, Stratham/Gelorup	Medium	Urban area with significant bush blocks associated with the Greater Bunbury area. Multiple access routes, but with internal cul-de-sacs and dead ends. Linkage to continuous forest/coastal fuels on outskirts.
			Augusta	Medium	Coastal town with significant resident population that has high visitation during the fire season, and forested/coastal heath corridors leading into the townsite.
			Boranup campsites	Medium	This campsite has a high fire season visitation and medium resilience to bushfire

Fire area	management	Asset class	Asset description and occurrences	Resilience	Rationale
LRR		Dispersed population	Caves Rd	Low	Major tourism road with high utilisation in the peak fire period. Multiple points of contact with significant forest/coastal heath fuels.
		Protected species and communities	<i>Anstisia</i> sp. Habitat (formerly known as <i>Geocrinia</i> sp.)		
Regional priority 3					
SHS		Settlements	Boyanup, Boyup Brook, Brunswick Junction, Burekup, Carbanup, Cookernup, Dardanup, Dinninup, Duranillin, Roelands, Vasse, Wokalup	High	Several access points, primarily surrounded by pasture and agricultural zone.
			Allanson, Balingup, Bridgetown, Capel, Collie, Cowaramup, Darkan, Donnybrook, Harvey, Karridale, Kudardup, Mullalyup, Newlands, Witchcliffe, Yarloop	High	Significant agricultural zone surrounding town, some forested corridors leading into the townsites. Multiple highly trafficable access routes.
			Greenbushes, Nannup, Rosa Brook	High	Mixed forest/agricultural zone surrounding town, some timber structures and forested corridors leading into the townsite. Multiple highly trafficable access routes.
			Bunbury, Busselton, Dunsborough	High	Major urban area with variety of fuels interfacing fringe area. Some pockets of significant vegetation within townsite, but primarily low fire prone area.
			Contos campground	High	Surrounded by continuous coastal shrubland fuels, one access route, and limited water available for firefighting.
LRR	Critical infrastructure		Forrest Hwy, South West Hwy, Vasse Hwy, Bussell Hwy, Coalfields Hwy	Medium	Major highways that pass through significant areas of dry eucalypt forest, high seasonal use in summer.
			Collie Power Station, Bluewaters Power Station, Muja Power Station	Medium	Major State power generation sites with significant impacts to SW Grid power supply if shutdown.
			South 32 Conveyor	Medium	Major ore carrier from Mt Saddleback to the refinery at Worsley.
			Alcoa conveyors	Medium	Wagerup to Willowdale to crushers.
			Dampier-Bunbury Gas Pipeline	Medium	
			Bunbury – Collie rail line	Medium	Critical supply and product export routes for South32 (Worsley) bauxite refinery. Also critical for coal exports from Collie.
			Binningup desalination plant	Medium	Major component of Perth metropolitan water supply which feeds into the integrated water network. DBCA-managed land can affect the power supply to this facility.
			McLarty Explosive reserve	Medium	Includes a significant buffer with a detailed fuel management plan.
	Dispersed population		Argyle/Hetherington/Gwindinup, Bowelling, Wellington Mills, Myalup Pines Cottages	Medium	
			Sues Rd	Medium	
	Protected species and communities		Quokka habitat	Medium	Species highly mobile and widely dispersed.
	Economic assets		Balingup Plantation, Dalgarpur Plantation, Folly Plantation, Maidment Plantation	Low	High value forest assets which are important economic drivers for communities within the South West Region and have some influences on the State economy.
			Kemerton Industrial area, South 32 Refinery.	Medium	
	Other assets		Wellington National Park, Bibbulmun Track, Munda Bididi Trail, Cape to Cape track, Wiilman Bilya walk trail	Low	

Fire area	management	Asset class	Asset description and occurrences	Resilience	Rationale
			Wooden man-made structure; Modified or Scarred tree	Low	These cultural asset types can be completely destroyed by fire as they are made from wood and also occur in landscapes that tend to be relatively undisturbed and therefore surrounded by vegetation.
			Customary activity sites	Various but can be low	Customary activity sites are varied in how they are impacted by bush fire, fire suppression and prescribed burning activities. For example, areas that are used for bush food collection particularly for geophytes can be impacted if fire occurs at an inappropriate time of year or if fire occurs at too regular intervals. Conversely grassland areas that are considered good hunting ground for large herbivores tend to favour more regular burning intervals.
Regional priority 4					
LRR		Economic assets	Baudin Plantation, Brunswick Plantation, Bussell Plantation, Darrell Plantation, Ellis Plantation, Ferndale Plantation, Goonac Plantation, Harvey Weir Plantation, Jarrahwood Plantation, Kelly Plantation, Lewana Plantation, Mandalay Plantation, Mungalup Plantation, Nelson Plantation, Shelley Plantation, Tallanalla Plantation, Thomson Brook Plantation, Wellington Plantation	Medium	High value forest assets which are important economic drivers for communities within the South West Region and have some influences on the State economy.
			Bunbury – Manjimup rail	Medium	Disused railway, still considered a State asset, wooden bridges across rivers.
Regional priority 5					
LRR		Economic assets	Wineries, Apiarists, Bowelling Plantation, Brockman Plantation, Claymore Plantation, Grimwade Plantation, Ludlow Plantation, Margaret Plantation, McLarty Plantation, Milesi Plantation, Milward Plantation, Myalup Plantation, Savage Creek Plantation, Southampton Plantation, Stockton Plantation, Vasse Plantation, Wilcock Plantation	High	Most wineries have a high resilience to direct impact from bushfire, however smoke from neighbouring bushfires or burns (within 5km) may have an impact on their product. High value forest assets which are important economic drivers for communities within the South West Region and have some influences on the State economy.
		Critical infrastructure	Perth-Bunbury rail line	High	Critical supply and product export routes for the Alcoa (Wagerup) bauxite refinery. Also, an important public transport link.

6. Indicators of acceptable bushfire risk

Bushfire risk is maintained at an acceptable level in the South West 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 West 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 <i>Banksia</i> woodland	1km surrounding settlements	
	<i>P. pinaster</i> plantation	500m surrounding settlements	
Landscape risk reduction (LRR)	Dry eucalypt forest Wet eucalypt forest	Remainder of South West BRMZ	45% of fuel less than threshold intensity
	<i>Banksia</i> woodland <i>P. pinaster</i> plantation Sandplain shrubland	Remainder of South West BRMZ	30% of fuel less than threshold intensity

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 West 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,
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