



# Bushfire Risk Management Plan

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**2020 – 2025**

**DRAFT V0.14**

*Office of Bushfire Risk Management (OBRM) Bushfire Risk Management (BRM) Plan reviewed*

*27th May 2020*

*Shire of Cuballing Endorsement – 17<sup>th</sup> June 2020*

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## Document Control

Document Name	Bushfire Risk Management Plan	Current Version	
Document Owner	Shire of Cuballing CEO	Issue Date	DD/MM/YYYY
Document Location	Shire Office	Next Review Date	DD/MM/YYYY

## Document Endorsements

The Shire of Cuballing Council endorses that the Bushfire Risk Management Plan (BRM Plan) has been reviewed and assessed by the Office of Bushfire Risk Management as compliant with the standard for bushfire risk management planning in Western Australia, the *Guidelines for Preparing a Bushfire Risk Management Plan*.

The Shire of Cuballing is the owner of this document and has responsibility, as far as is reasonable, to manage the implementation of the BRM Plan and facilitate the implementation of bushfire risk management treatments by risk owners.

The endorsement of the BRM Plan by the Shire satisfies their endorsement obligations under section 2.2.7 of the *State Hazard Plan for Fire (Interim, Nov 2017)* (formerly *Westplan Fire*).

Local Government	Representative	Signature	Date
Shire of Cuballing	Gary Sherry CEO		

## Local Government Disclaimer

In approving this BRM Plan, the Shire of Cuballing is acknowledging the assets that have been identified and the risk ratings and treatment priorities assigned. Endorsement of the plan is a commitment by the Shire to work with land owners and managers to address unacceptable risk within the community. Endorsement of this plan is not committing the Shire to a program of treatment works to be implemented by others, or an acceptance of responsibility for risk occurring on land that is not owned or managed by the Shire.<sup>1</sup>

## Amendment List

Version	Date	Author	Section

<sup>1</sup> *Guidelines for Preparing a Bushfire Risk Management Plan, November 2015, Page 79*

## Publication Information

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# 1. Introduction

## 1.1 Background

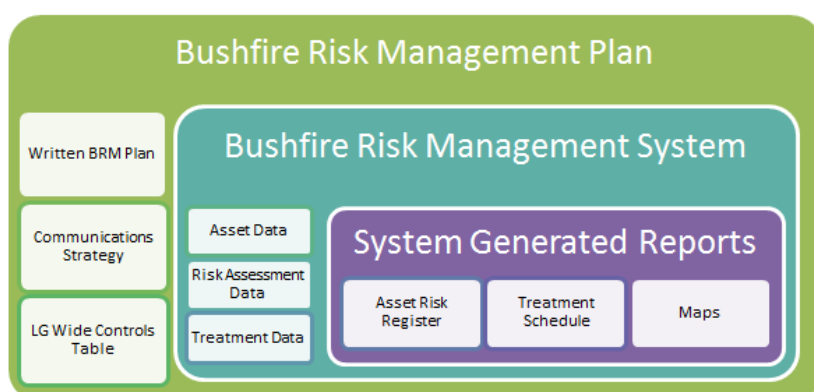
Under the *State Hazard Plan (Fire)* an integrated Bushfire Risk Management Plan (BRM Plan) is to be developed for local governments identified as having a significant bushfire risk. This BRM Plan has been prepared for the Shire of Cuballing in accordance with the requirements of the *Guidelines for Preparing a Bushfire Risk Management Plan*.

The risk management processes used to develop this BRM Plan are aligned to the key principles of *AS/NZS ISO 31000:2009 Risk management – Principles and guidelines (AS/NZS ISO 31000:2009)*, as described in the Second Edition of the *National Emergency Risk Assessment Guidelines (NERAG 2015)*. This approach is consistent with the policies of the State Emergency Management Committee.

This BRM Plan is a strategic document that identifies assets at risk from bushfire and their priority for treatment. The resulting ‘Treatment Schedule’ sets out a broad program of coordinated multi-agency treatments to address risks identified in the BRM Plan. Government agencies and other land managers responsible for implementing treatments participate in developing the BRM Plan to ensure treatment strategies are collaborative and efficient, regardless of land tenure. Treatments will be guided by risk priority, not land tenure, and will not be limited to local government managed lands.

This BRM Plan, as reflected in *Figure 1* below, consists of:

- Bushfire Risk Management Plan
- Communications Strategy (**Appendix 1**)
- Local Government Wide Controls & Multi Agency Work Plan (**Appendix 2**)
- Asset Risk Register (*refer to section 4.2.4*)
- Treatment Schedule (to be completed within 6 months of endorsement of the BRM Plan)



*Figure 1: Components of the Bushfire Risk Management Plan <sup>2</sup>*

Assets, risk assessments and treatment data are stored and maintained in an electronic database – the Bushfire Risk Management System (BRMS). Shire personnel will have access to the Shire’s data and are able to produce reports including the *Asset Risk Register* and *Treatment Schedule* as well as maps.

## 1.2 Aim and Objectives

The aim of the BRM Plan is to document a coordinated and efficient approach toward the identification, assessment and treatment of assets exposed to bushfire risk within The Shire of Cuballing.

<sup>2</sup> Source: *Bushfire Risk Management Handbook, Department of Fire and Emergency Services, 2017.*

The overarching objective of the BRM Plan is to effectively manage bushfire risk within the Shire of Cuballing to protect people, assets and other things of local value. Additional objectives of this BRM Plan include:

- Guide and coordinate a tenure blind, multi-agency bushfire risk management program over a five-year period;
- Document the process used to identify, analyse and evaluate risk, determine priorities and develop a plan to systematically treat risk;
- Facilitate the effective use of the financial and physical resources available for bushfire risk management activities;
- Integrate bushfire risk management into the business processes of local government, land owners and other agencies;
- Ensure there is integration between land owners and bushfire risk management programs and activities;
- Monitor and review the implementation of treatments to ensure treatment plans are adaptable and risk is managed at an acceptable level.

### 1.3 Legislation, Policy and Standards

The following legislation, policy and standards were applicable in the development and implementation of the BRM Plan.

#### 1.3.1 Legislation

- *Aboriginal Heritage Act 1972*
- *Building Act 2011*
- *Bush Fires Act 1954*
- *Bush Fires Regulations 1954*
- *Conservation and Land Management Act 1984*
- *Country Areas Water Supply Act 1947*
- *Emergency Management Act 2005*
- *Emergency Management Regulations 2006*
- *Environmental Protection Act 1986*
- *Environmental Protection and Biodiversity Conservation Act 1999 (Cth)*
- *Fire and Emergency Service Act 1998*
- *Fire Brigades Act 1942*
- *Metropolitan Water Supply, Sewerage and Drainage Act 1909*
- *Planning and Development (Local Planning Scheme) Regulations 2015*
- *Wildlife Conservation Act 1950*

#### 1.3.2 Policies, Guidelines and Standards

- AS 3959-2009 Construction of buildings in bushfire-prone areas
- AS/NZS ISO 31000:2009 - Risk Management – Principles and Guidelines
- Building Protection Zone Standards (DFES)
- Bushfire Risk Management Planning – Guidelines for preparing a Bushfire Risk Management Plan (2015)
- Firebreak Location, Construction and Maintenance Guidelines (DFES)
- Guidelines for Planning in Bushfire Prone Areas (2015)
- Guidelines for Plantation Fire Protection (DFES 2011)
- National Emergency Risk Assessment Guidelines (NERAG) (Second Edition 2015)
- State Emergency Management Policy 2.5 – Local Arrangements
- State Emergency Management Policy 3.2 – Emergency Risk Management Planning
- State Emergency Management Preparedness Procedure 7 – Local Emergency Management Committee (LEMC)

- State Emergency Management Preparedness Procedure 8 – Local Emergency Management Arrangements
- State Emergency Management Prevention Procedure 1 – Emergency Risk Management Planning
- State Hazard Plan for Fire (formerly Westplan Fire)
- State Planning Policy 3.4: Natural Hazards and Disasters
- State Planning Policy 3.7: Planning in Bushfire Prone Areas
- Western Australian Emergency Risk Management Guide 2015

### **1.3.3 Shire of Cuballing References**

- Shire of Cuballing Strategic Community Plan 2017 – 2027
- Shire of Cuballing Local Emergency Management Arrangements 2016
- Shire of Cuballing Local Planning Strategy - June 2019
- Shire of Cuballing - Annual Fire Break Notice
- Shire of Cuballing - Integrated Workforce Plan 2017-2021
- Assessment of the Conservation value of roadside vegetation in the Shire of Cuballing (1998)
- Shire of Cuballing - Bushfire Prone Planning
- Cuballing Bridge Inventory (Main Roads Sept 2017)
- Local Planning Strategy Bushfire Hazard Level Assessment Nov 2016
- Dryandra Woodland Management Plan No 70 2011

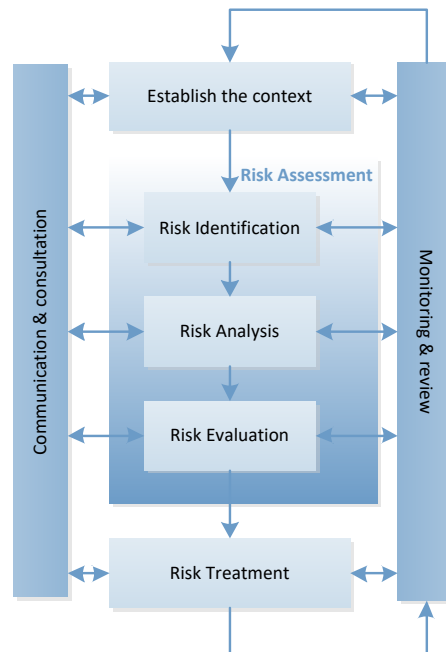
### **1.3.4 Other Related Documents**

- National Strategy for Disaster Resilience
- National Statement of Capability for Fire and Emergency Services (AFAC 2015)
- Public Service Circular No. 88 Use of Herbicides in Water Catchment Areas (Dept. of Health 2007)
- Code of Practice for Timber Plantations in Western Australia (Forest Products Commission 2014)



## 2. The Risk Management Process

The risk management processes used to identify and address risk in this BRM Plan are aligned with the international standard for risk management, AS/NZS ISO 31000:2009, as described in NERAG (2015). This process is outlined in *Figure 2* below.



*Figure 2 - An overview of the risk management process<sup>3</sup>*

### 2.1 Roles and Responsibilities

The roles and responsibilities of the key stakeholders involved in the development of the BRM Plan are outlined in Table 1.

**Table 1 – Roles and Responsibilities**

Stakeholder Name	Roles and Responsibilities
<b>Local Government</b>	<ul style="list-style-type: none"> <li>▪ As custodian of the BRM Plan, coordination of the development and ongoing review of the integrated BRM Plan.</li> <li>▪ Negotiation of commitment from land owners to treat risks identified in the BRM Plan.</li> <li>▪ As treatment manager, implementation of treatment strategies.</li> <li>▪ As part of the approval process, submission of the draft BRM Plan to the Office of Bushfire Risk Management (OBRM) to review it for consistency with the Guidelines.</li> <li>▪ As part of the approval process, submission of the final BRM Plan to council for their endorsement and adoption.</li> </ul>
<b>Department of Fire and Emergency Services (DFES)</b>	<ul style="list-style-type: none"> <li>▪ Participation in and contribution to the development and implementation of BRM Plans, as per their agency responsibilities as the Hazard Management Agency for fire.</li> <li>▪ Support to local government through expert knowledge and advice in relation to the identification, prevention and treatment of bushfire risk.</li> <li>▪ Facilitation of local government engagement with state and federal government agencies in the local planning process.</li> </ul>

<sup>3</sup> Source: AS/NZS ISO 31000:2009, *Figure 2*, reproduced under SAI Global copyright Licence 1411-c083.

Stakeholder Name	Roles and Responsibilities
	<ul style="list-style-type: none"> <li>▪ Undertake treatment strategies, including prescribed burning on behalf of Department of Lands for Unmanaged Reserves and Unallocated Crown Land within gazetted town site boundaries.</li> <li>▪ In accordance with Memorandums of Understanding and other agreements, implementation of treatment strategies for other landholders.</li> <li>▪ Ensure bushfire risk is managed in accordance with AS/NZS ISO 31000 and reporting on the state of bushfire risk across Western Australia.</li> <li>▪ Review BRM Plans for consistency with the Guidelines prior to final endorsement by council.</li> </ul>
<b>Department of Biodiversity, Conservation and Attractions - Parks and Wildlife Service (PWS)</b>	<ul style="list-style-type: none"> <li>▪ Participation in and contribution to the development and implementation of BRM Plans.</li> <li>▪ Providing advice for the identification of environmental assets that are vulnerable to fire and planning appropriate treatment strategies for their protection.</li> <li>▪ As treatment manager, implementation of treatment strategies on department managed land and for Unmanaged Reserves (UMR) and Unallocated Crown Land (UCL) outside gazetted town site boundaries.</li> <li>▪ In accordance with Memorandums of Understanding and other agreements, implementation of treatment strategies for other landholders.</li> </ul>
<b>Other State and Federal Government Agencies</b>	<ul style="list-style-type: none"> <li>▪ Assist the local government by providing information about their assets and current risk treatment programs.</li> <li>▪ Participation in and contribution to the development and implementation of BRM Plans.</li> <li>▪ As treatment manager (where applicable), identification and implementation of treatment strategies.</li> </ul>
<b>Public Utilities</b>	<ul style="list-style-type: none"> <li>▪ Assist the local government by providing information about their assets and current risk treatment programs.</li> <li>▪ Participation in and contribution to the development and implementation of BRM Plans.</li> <li>▪ As treatment manager, implementation of treatment strategies.</li> </ul>
<b>Corporations and Private Land Owners</b>	<ul style="list-style-type: none"> <li>▪ Assist the local government by providing information about their assets and current risk treatment programs.</li> <li>▪ Participation in and contribution to the development and implementation of BRM Plans and Treatment Schedules.</li> <li>▪ As land owner/treatment manager, identification and implementation of treatment strategies.</li> </ul>
<b>Other Stakeholders</b>	<ul style="list-style-type: none"> <li>▪ Participation in and contribution to the development and implementation of BRM Plans and Treatment Schedules.</li> <li>▪ Providing advice for the identification of assets that are vulnerable to fire.</li> <li>▪ Providing advice on appropriate treatment strategies for asset protection.</li> </ul>

## 2.2 Communication & Consultation

As indicated in Figure 2, communication and consultation throughout the risk management process is fundamental to the preparation of an effective BRM Plan. To ensure appropriate and effective communication occurred with relevant stakeholders in the development of the BRM Plan, a *Communication Strategy* was prepared. This is provided at **Appendix 1**.

### 3. Establishing the Context

#### 3.1 Description of the Local Government and Community Context

##### 3.1.1 Strategic and Corporate Framework

The Shire of Cuballing's vision is *"Cuballing is a progressive, diverse and caring community, with access to modern services and infrastructure, in a unique part of the world."*<sup>4</sup> and the mission is *"To provide the leadership, facilities, infrastructure and services that will serve the needs of our community."*<sup>5</sup> A key element of this is ensuring that the bushfire risk is managed to reduce impacts on life, critical infrastructure and services as well as ensuring the preparation and resilience of communities to fire events.

The Shire of Cuballing's values are:

- Transparency – by being open and accountable
- Honesty – by acting with integrity and building trust.
- Respect – by being tolerant, helpful and showing empathy and care for others.
- Dedication – in the continual pursuit of excellence
- Proactivity – through forward thinking and being positive.
- Cohesiveness – through teamwork, unity and shared ownership.<sup>6</sup>

The Shires commitment to these values are reflected throughout this document and are contextualised against each of the key result areas discussed below.

The Shire's Key Strategic Themes which support the delivery of the Vision, Mission and Values outline the Shire's commitment to community safety, risk management and effective management of the environment and natural resources. The following key result areas, activities and objectives are identified as having direct relevance to the objectives of this BRM Plan:

##### **Social: - Our community, neighbourhoods, recreation and culture**

- A healthy and caring community which has a strong support base for all ages and abilities
- A safe community where residents feel safe secure and comfortable at home, work and play.

##### **Key Results - Social Theme;**

- Strategy 1.3 – Encourage and support volunteers and community groups.
  - Outcome – Active and growing community Groups
- Strategy 1.7 – Create and maintain a safe environment for the community.
  - Outcome – A feeling of safety within our neighbourhoods and a sense of being looked out for.

In the context of the BRM Plan, the Shire recognises and values the efforts and dedication of the members of the local volunteer emergency services brigades and is committed to providing the necessary support and resources to enable them to respond to bushfires as safely as possible

##### **Environment: - Our environment, resource management and services**

- Valuing our unique environment and ensuring the natural resources within the Shire are recognised as an important asset and managed in a suitable way.
- Recognising the environmental and recreational value of Council reserves and managing them in a way that will preserve them for future generations to enjoy.

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<sup>4</sup> Shire of Cuballing Strategic Community Plan 2017 - 2027

<sup>5</sup> Shire of Cuballing Strategic Community Plan 2017 - 2027

<sup>6</sup> Shire of Cuballing Strategic Community Plan 2017 - 2027

- Aiming for the equitable and sustainable development of land within the Shire of Cuballing that provides a genuinely desirable lifestyle.

#### Key Results - Environmental Theme;

- Strategy 2.1 – Protect, restore and enhance the Shire’s natural assets.
  - Outcome – An environment which is effectively managed for future generations and for the intrinsic value of its biodiversity.
- Strategy 2.2 – Educate the community on ways to use our environment responsibly and build environmental awareness.
  - Outcome – A community which values and respects the environment.

In the context of this BRM Plan, the Shire of Cuballing is committed to addressing fire risks and working with stakeholders to reduce this risk and will do so in a way to minimise negative impacts upon the environment.

#### Economic: Our economy, infrastructure, systems, services and management

- Community infrastructure and services delivered in a timely manner, are well utilised, effective and meet the community standards.
- Transport systems are functional, efficient, economical and safe, coupled with continuous improvement to meet the safety and amenity needs of the community.
- Managing community assets in a whole of life and economically sustainable manner.

#### Key Results - Economic Theme;

- Strategy 3.2 – Ensure essential services and infrastructure are aligned to the community needs now and in the future.<sup>7</sup>
  - Outcome – Services and infrastructure which meet the needs of the broadest community and responds to changing priorities.

In the context of this BRM Plan, the Shire of Cuballing is committed to ensuring land and infrastructure developments reflect best practice fire mitigation principles.

#### Governance and Organisation: Our Council, services, policies and engagement

- Governance structures that ensure accountable, transparent and ethical decision making.
- A council that proactively engages with all elements of its community to make decisions that reflect positively on the future of the Shire of Cuballing.

#### Key Results - Governance and Organisational Theme;

- Strategy 4.1 – Councillors provide strong and visionary leadership
  - Outcome – A clear direction for the future
- Strategy 4.3 – Ensure open and consistent communication between the Shire and the community
  - Outcome – The community is aware of council decisions and activities.
- Strategy 4.4 – Actively engage with the community to inform decision making and improve conversations within the community.
  - Outcome – The community have a variety of opportunities to be involved and are able to make meaningful contributions to decision making.<sup>8</sup>

In the context of this BRM Plan, the Shire of Cuballing is committed to engaging with the community and stakeholders on matters related to bushfire risk management and maintaining compliance with bushfire related legislation including the responsible expenditure of any mitigation grant funding.

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<sup>7</sup> Shire of Cuballing Strategic Community Plan 2017 - 2027

<sup>8</sup> Shire of Cuballing Strategic Community Plan 2017 - 2027

The size of the Shire’s structure and available funding does not support a role specifically allocated to Emergency Management. It has been determined that this responsibility will be delegated by the Chief Executive Officer as appropriate. Tasks may be delegated to the Chief Bush Fire Control Officer (CBFCO), which is a volunteer position appointed by the Shire in accordance with the *Bush Fires Act 1954*. The following table 2, reflects the functions and positions within the Shire of Cuballing critical to the successful achievement of the objectives of this BRM Plan.

**Table 2 – Functions/positions within Shire of Cuballing critical to this Bushfire Risk Management Plan**

Function	Roles
<b>Shire of Cuballing Leadership Team</b>	<ul style="list-style-type: none"> <li>▪ Oversight of the implementation, monitoring and review of the Bushfire Risk Management Plan</li> <li>▪ Sourcing and approving funding and expenditure</li> <li>▪ Monitoring the implementation of agreed treatments</li> <li>▪ Liaison with key stakeholders</li> <li>▪ Participation on Local Emergency Management Committee (LEMC)</li> <li>▪ Management of the release of BRMS Plan and BRMS data</li> </ul>
<b>Person/s Tasked with Emergency Management within the Shire Administration Team</b>	<ul style="list-style-type: none"> <li>▪ Develop practices for fire management on LG, UCL and UMR land</li> <li>▪ In consultation, planning annual schedule of works</li> <li>▪ Build knowledge and understanding of fire management practices within the community</li> <li>▪ Participation on Bushfire Advisory Committee (BFAC)</li> <li>▪ Support bushfire meetings and committees</li> <li>▪ Oversee burning programs and support from local brigades</li> <li>▪ Contributing to treatment planning</li> <li>▪ Negotiating with stakeholders</li> </ul>
<b>Chief Bushfire Control Officer</b>	<ul style="list-style-type: none"> <li>▪ Oversee burning programs and support from local brigades</li> <li>▪ Contributing to treatment planning</li> <li>▪ Negotiating with stakeholders</li> <li>▪ Fire breaks inspection and enforcement</li> <li>▪ Participation on Bushfire Advisory Committee (BFAC)</li> </ul>
<b>Shire of Cuballing Works Department</b>	<ul style="list-style-type: none"> <li>▪ Contributing to treatment planning</li> <li>▪ Undertake planned works</li> </ul>
<b>Shire of Cuballing Town Planning</b>	<ul style="list-style-type: none"> <li>▪ Ensure adherence to building codes and planning scheme</li> <li>▪ Bushfire prone mapping</li> </ul>
<b>Shire of Cuballing Finance Department</b>	<ul style="list-style-type: none"> <li>▪ Accessing and managing grants and funding</li> </ul>

*NOTE: Some functions outlined above may be fulfilled through the employment of contract personnel*

The Shire's Local Emergency Management Committee (LEMC) and Bushfire Advisory Committee (BFAC) are identified as key stakeholders in the development, implementation and review of the BRM Plan. Their input and advice are critical to the bushfire risk management process and will provide an important forum for consultation, joint-agency partnerships and the resolution of local issues affecting bushfire risk management. The Local Emergency Management Arrangements reflect bushfire as a high risk within the Shire of Cuballing.

The BRM Plan will assist by improving the community's awareness of bushfire risk and planned treatment activities. Identification of treatment priorities will assist the Shire's forward planning and budgeting for treatment activities related to bushfire risk within the BRM Plan area.

The Shire has a scheduled annual works program and proactively addresses risks identified on Shire managed land, within their budgetary constraints. An advantage of the Shire's structure currently, is that the Works Supervisor also holds the position of Chief Bush Fire Control Officer (CBFCO). The benefit being that considerations around bushfire preparedness, prevention, response and recovery are more readily embedded into the Shire's daily business.

The following challenges have been identified for the Shire, all of which have the potential to impact the objectives of this BRM Plan, consequently special consideration should be given to these matters during the life of this plan:

- Changes to agricultural practices
- Aging population
- Attraction and retention of residents impacting succession planning within the emergency services volunteer brigades
- Vulnerable groups, such as the elderly, itinerant workers and recreational visitors
- The volume of traffic moving through the Shire along known ignition routes
- Telecommunications network and phone coverage

The challenges outlined above, and the priority areas detailed below, together with the actions being undertaken by the Shire in relation to these challenges and priorities, are referenced further in this document.

The Shire has identified several priority areas that need to be considered in the bushfire risk planning processes both in the context of this BRM Plan and beyond. These include:

- The risk of fire travelling along waterways in and around the more populated areas of the shire
- Limitations of water access particularly in the Popanyinning townsite with water pressure issues and long delays in turnaround times when refilling
- Bridges have been identified as a significant risk due to the replacement cost and the potential economic impact if transport routes are interrupted for extended periods. The Bridges in the Shire are predominantly timber construction
- Management of unallocated crown land (UCL) and unmanaged reserves (UMR) both within and outside town boundaries
- Management of reserves around the town boundary
- Vegetation in and around telecommunications and public utility infrastructure such as the communications towers, water pipeline, pumping station and the railway
- Road reserves, particularly as shire statistics reflect these are known fire ignition points

These priority areas have been identified from matters raised through corporate governance processes such as Council, Local Emergency Management Committee, Bushfire Advisory Committee and local knowledge. The location of assets in relation to vegetation and their importance for the Shire's response and recovery activities have driven these risks.

### 3.1.2 Location, Boundaries and Tenure

The Shire of Cuballing is in the south-west interior of Western Australia within the Wheatbelt Region as depicted in *Figure 3*. The Shire is situated in pleasant and undulating broad acre farming country. The Shire is located 192km southeast from Perth and covers an area of 1195 km<sup>2</sup>.



*Figure 3: The location of the Shire of Cuballing within the State of WA*<sup>9</sup>

The Shire’s main townsites are Cuballing and Popanyinning with a smaller settlement in Yornaning, these are shown in *Figure 4*.



*Figure 4– Map showing the locality of the townsites within the Shire of Cuballing*<sup>10</sup>

The Shire of Cuballing includes the localities of Wardering, Commodine, Townsendale, Stratherne, East Popanyinning, West Popanyinning, Lol Gray, Dryandra and Contine.

Adjoining local government authorities include the Shires of Narrogin, Wandering, Pingelly, Wickepin and Williams. Refer to *Figure 5* below:

<sup>9</sup> Source: *Shire of Cuballing Strategic Community Plan 2017 - 2027*

<sup>10</sup> Source: *DFES Bushfire Risk Management System*



Figure 5: Map reflecting the Shires adjoining the Shire of Cuballing<sup>11</sup>

An overview of the Shires land tenure and management are shown in *Table 3*. The Shire is made up of a mosaic of land tenures. Fires may impact on multiple tenures and move through various land uses. *Table 3* reflects 86.1% of land tenure is private ownership with the majority of this used for agricultural purposes, predominantly broad acre farming. Approximately 61% of the Shire of Cuballing is arable land.<sup>12</sup> The private land holdings are predominantly owned by local families with fewer landowners owning larger parcels of land. Some of the challenges related to this include:

- If one landholder does not act in accordance with the Shires bylaws this can increase the risk to other landowners, particularly those on adjoining properties
- The loss of one farm can have significant economic and social implications for the Shire
- There needs to be consideration given to balancing the impacts of mitigation and risk reduction in the context of productivity and associated costs

Table 3 – Overview of Land Tenure and Management within the Shire of Cuballing<sup>13</sup>

Land Manager	% of Plan Area
Shire of Cuballing	0.3
Department of Planning, Lands and Heritage and other government agencies	0.6
Department of Biodiversity, Conservation and Attractions	13
Private ( <i>predominantly agricultural holdings</i> )	86.1
<b>Total</b>	<b>100</b>

The following diagram, *Figure 6*, reflects the distribution of the different land tenure through the Shire of Cuballing.

<sup>11</sup> Source: DFES Bushfire Risk Management System

<sup>12</sup> Department of Primary Industry and Regional Development

<sup>13</sup> Source: Department of Fire and Emergency Services Geographical Information Systems Section using SLIP data



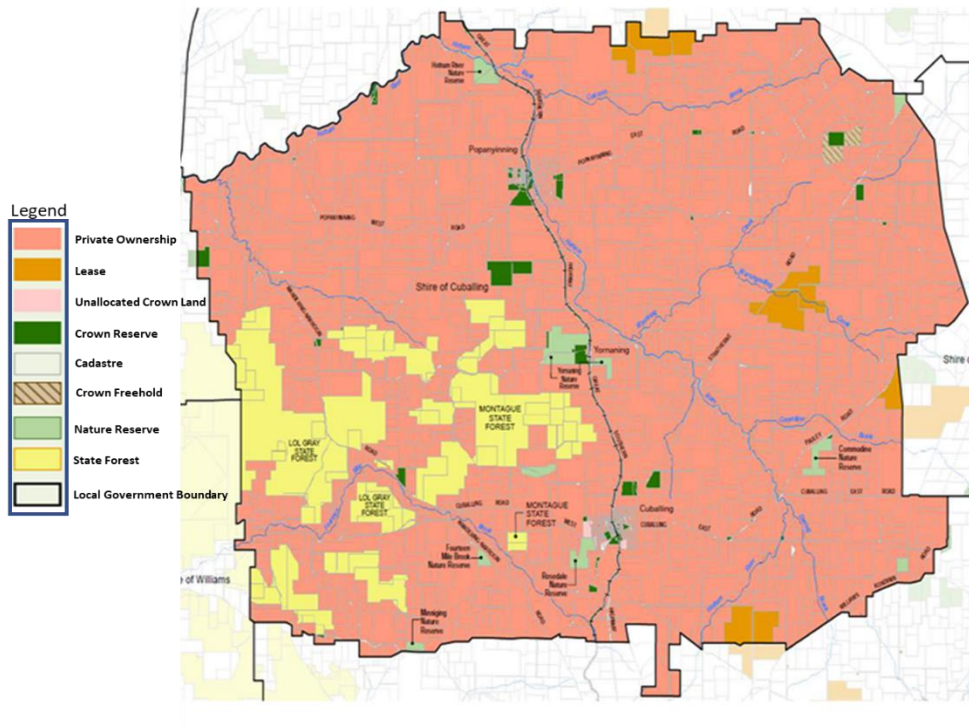


Figure 6: The Shire of Cuballing Land Tenure<sup>14</sup>

Unallocated Crown Land (UCL) and Unmanaged Reserves (UMR) constitutes less than 0.1% of the total land tenure within the Shire. UCL/UMR located within the townsites are managed by the Department of Fire and Emergency Services with UCL/UMR located outside of the townsites managed by the Department of Biodiversity, Conservation and Attractions (DBCA). These management arrangements result from a memorandum of understanding (MOU) with the WA Department of Lands.

Effective UCL/UMR Management within the Shire of Cuballing is necessary as UCL/UMR forms the rural-urban interface (RUI) and the vegetation on UCL/UMR is a significant driver of the Shires bushfire risk. A strong relationship has already been developed between the Shire, DFES and DBCA in recognition of the bushfire risk posed by UCL/UMR.

Figure 7 reflects the location of UCL/UMR across the Shire whereas Figures 8, 9 and 10 show the location of the UCL/UMR within the townsites of Popanyinning, Yornaning and Cuballing respectively.

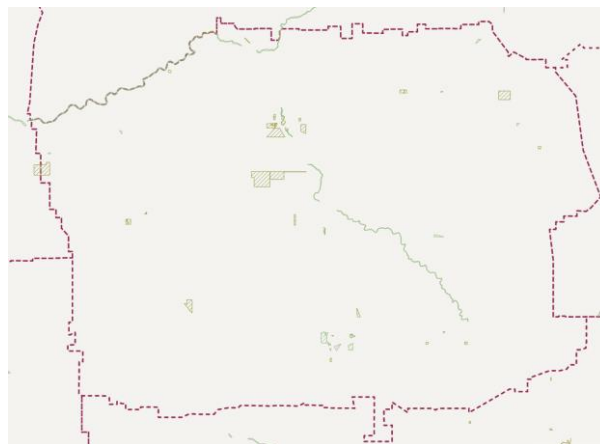


Figure 7: The location of UCL/UMR within the Shire of Cuballing<sup>15</sup>

<sup>14</sup> Source: Shire of Cuballing Local Planning Strategy

<sup>15</sup> Source: DFES Bushfire Risk Management System



Figure 8: The location of UCL/UMR within the Townsite of Popanyinning<sup>16</sup>

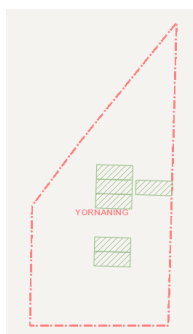


Figure 9: The location of UCL/UMR within the Townsite of Yornaning<sup>17</sup>

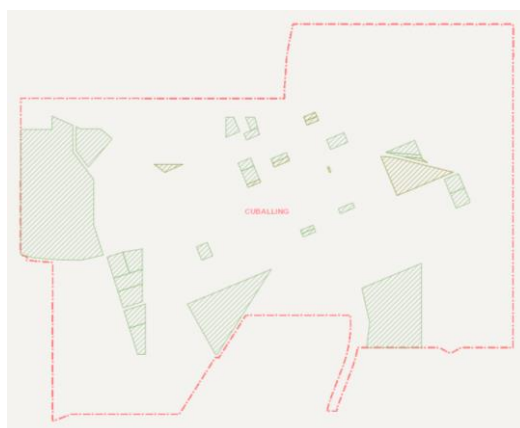


Figure 10: The location of UCL/UMR within the Townsite of Cuballing<sup>18</sup>

### 3.1.3 Population and Demographics

The Shire of Cuballing, located in the Wheatbelt Region of Western Australia, is primarily an agricultural based shire. The Shire of Cuballing has an estimated population of around 897 (*ABS-3218.0 Regional Population Growth, Australia*).

Figure 11 reflects that the majority of the Shire’s residents are Australian born (73.4%) with 6.1% emigrating from England, 1.6% from New Zealand and less than 1.1% from South Africa and less than 1% from Thailand and Ireland.

<sup>16</sup> Source: DFES Bushfire Risk Management System

<sup>17</sup> Source: DFES Bushfire Risk Management System

<sup>18</sup> Source: DFES Bushfire Risk Management System

Country of birth	Cuballing (S)	%	Western Australia	%	Australia	%
Australia	626	73.4	1,492,842	60.3	15,614,835	66.7
<i>Other top responses</i>						
England	52	6.1	194,163	7.8	907,570	3.9
New Zealand	14	1.6	79,221	3.2	518,466	2.2
South Africa	9	1.1	41,008	1.7	162,449	0.7
Thailand	5	0.6	7,806	0.3	66,229	0.3
Ireland	4	0.5	18,036	0.7	74,888	0.3

In Cuballing (S) (Local Government Areas), 73.4% of people were born in Australia. The most common countries of birth were England 6.1%, New Zealand 1.6%, South Africa 1.1%, Thailand 0.6% and Ireland 0.5%.

Figure 11: Population within the Shire of Cuballing by Country of Birth<sup>19</sup>

In contrast to much of the wheatbelt, the Shire of Cuballing’s population has increased in recent years (22% in the last decade) with a growing number of people seeking the benefits that a small, friendly community like the towns of Cuballing and Popanyinning offer. Cuballing townsite has a population around 350. Popanyinning has a smaller population of approximately 250. The remainder of the Shire’s population lives outside the town boundaries on farming and lifestyle properties.

Living in Cuballing, there is access to a wide range of sporting facilities, community service organisations and amenities. The larger centre outside of the shire, Narrogin to the south and Pingelly to the north, provide schools, shopping, banking and medical facilities. The proximity of the towns of Narrogin and Pingelly allows residents to work in these larger towns and enjoy the semi-rural lifestyle of the towns of Cuballing and Popanyinning. Cuballing is served by the Cuballing Tavern and the Cuballing Road House. Popanyinning has a general store and café.

The largest age demographics, as reflected in *Figure 12*, are people aged between 45 - 64. Whilst the statistics show healthy percentages in the 25 – 64 year old bracket, the source of emergency services volunteers, the low population numbers overall mean limited access to bushfire volunteers particularly when considering the broad competing priorities associated with smaller rural communities. This is a key consideration for the Shire.

The statistics show lower number of residents than the state average in the 15 - 24 age bracket, which is most likely the result of children leaving town for further education and/or employment. These residents often return to the community, or similar communities, when they have young families of their own, seeking a similar early life experience to what they enjoyed. This could explain the increase in the population in the 25 – 44+ age brackets.

The demographics of the Shire of Cuballing present a range of challenges for fire management. Thirty-seven percent (37.1%) of the population are in vulnerable groups (under 14 or over 65) which require special consideration when planning around prevention, preparedness, response and recovery.

The strong numbers within the 0 – 14 age bracket indicates that a school-based awareness program may be of benefit for early engagement. Children can influence behaviour changes within families and increasing awareness within the school environment via ‘Fire Chats’, for example, could result in increased awareness throughout the community.

The over 65 group accounts for approx. 22.7% of the population. Elderly people can be vulnerable in fire management, they might have reduced capacity to defend property or to protect themselves during a fire event and have additional needs should an evacuation be required. As a result, additional consideration for this group is essential to ensure that their needs are addressed in fire management planning, communications during events, community education and mitigation works. The Shire’s aged housing project has resulted in purpose built independent living units dedicated to the well-aged (those able to care for themselves and live independently) – thereby retaining the senior residents in Cuballing. Tailored advice should be considered during pre-fire season preparation as well as during fire events for this demographic.

<sup>19</sup> Source: Shire of Cuballing Strategic Community Plan 2017 - 2027

The aging population in the Shire presents challenges for attraction and retention of residents to volunteer roles, particularly physical roles such as volunteer fire fighting, which then impacts succession planning within the emergency services volunteer brigades. This is key in future planning for the Shire’s ability to respond to unplanned fires as well as to support mitigation activities.

The Shire, through the local Fire Brigades, hold youth days to encourage the younger members of the community to engage with the local brigades and to encourage membership. Hands on events, held annually, have proven to be highly successful in engaging younger community members to become registered volunteers. There is also advertising in the local paper.

Age	Cuballing (\$)	%	Western Australia	%	Australia	%
Median age	47	--	36	--	38	--
0-4 years	43	4.9	161,727	6.5	1,464,779	6.3
5-9 years	66	7.6	164,153	6.6	1,502,646	6.4
10-14 years	49	5.6	150,806	6.1	1,397,183	6.0
15-19 years	35	4.0	149,997	6.1	1,421,595	6.1
20-24 years	26	3.0	160,332	6.5	1,566,793	6.7
25-29 years	45	5.2	184,908	7.5	1,664,602	7.1
30-34 years	44	5.0	194,267	7.9	1,703,847	7.3
35-39 years	47	5.4	173,041	7.0	1,561,679	6.7
40-44 years	53	6.1	171,996	7.0	1,583,257	6.8
45-49 years	56	6.4	172,520	7.0	1,581,455	6.8
50-54 years	76	8.7	162,438	6.6	1,523,551	6.5
55-59 years	66	7.6	149,899	6.1	1,454,332	6.2
60-64 years	75	8.6	132,145	5.3	1,299,397	5.6
65-69 years	76	8.7	116,755	4.7	1,188,999	5.1
70-74 years	52	6.0	82,911	3.4	887,716	3.8
75-79 years	36	4.1	61,509	2.5	652,657	2.8
80-84 years	13	1.5	42,590	1.7	460,549	2.0
85 years and over	15	1.7	42,420	1.7	486,842	2.1

Figure 12: Population within the Shire of Cuballing by Age<sup>20</sup>

The Shire of Cuballing also plays host to recreational visitors year-round as well as itinerant workers largely employed in the agricultural industry during the peak seeding, harvesting and shearing seasons. Some of the challenges associated with recreational visitors and itinerant workers, in the context of bushfire management, include:

- They are often not connected to local networks so do not have ready access to information shared via this means or may not monitor local social media
- They may not understand the risk associated with bushfires which may result in actions such as lighting campfires in restricted periods or not managing campfires appropriately
- Not being familiar with road networks

There has previously been targeted community education focused on these groups and this should be continued where practicable.

The Shire is proactive in sharing emergency prevention, preparation, response and recovery related information using the Shire’s Facebook page and website.

### 3.1.4 Economic Activities and Industry

The economy of the Shire of Cuballing is based around the agricultural industry with cereal grains, sheep and pig farming the main activities.<sup>21</sup> Several more intensive agricultural enterprises, including cattle feedlots, are developing in the Shire. The economy is worth approximately \$20 million annually to the state.<sup>22</sup>

There has been a move to explore alternative crops throughout the broader wheatbelt region with some crops (i.e. canola or rapeseed) burning at a higher temperature which can be harder to extinguish

<sup>20</sup> Source: Shire of Cuballing Strategic Community Plan 2017 - 2027

<sup>21</sup> Source: Agriculture WA (July 2000). "Agriculture Statistical Overview 96/97 - Shire of Cuballing"

<sup>22</sup> Source: Agriculture WA

and mop up than native pastures.<sup>23</sup> Stubble is retained post-harvest to reduce soil erosion which maintains a combustible ground cover and increases fuel loads in pre-harvest fields. These changes in practice increases the landscape fire risk with higher probability of more intense fires which travel further due to fewer low fuel areas from which to manage or ‘hold up’ fires. Recent fires in the Shire of Katanning (February 2020) on similar agriculturally focused land tenure to that found in the Shire of Cuballing, highlighted potential economic impacts such as:

- The loss of top soil can reduce the soil conditioning and may take years for the soil quality to return to the pre-fire condition. This in turn can impact
  - quality of future crops
  - increased operational costs
- The potential loss of even one farm may have long term significant economic and social costs to the Shire through families leaving the shire which in turn can impact local businesses through loss of customer base as well as the number of people available to volunteering.

There is potential value in the Shire reviewing any post incident reviews from the Katanning fires when these become publicly available, in the context of relevant ‘lessons learnt’ that may be able to be applied to the Shire of Cuballing.

As part of the Shire’s existing fire mitigation they undertake an ongoing fuel management maintenance program which includes roadside spraying, tree trimming and shoulder grading in the Shire managed road reserves.

The Shire of Cuballing has the tier 2 railway line and Great Southern Highway running north-south through the centre of the Shire. The Cuballing East Road has been identified as a Grain Freight Route linking grain growing areas to the east with the Great Southern Highway through to delivery centres in Brookton.

Transport links, both rail and road, are key economic drivers of agricultural industries, as well as known fire ignition points (*as shown in Section 3.2.4*). These transport routes pose a definite risk to the Shire. The main transport routes are included in *Figure 13* below.

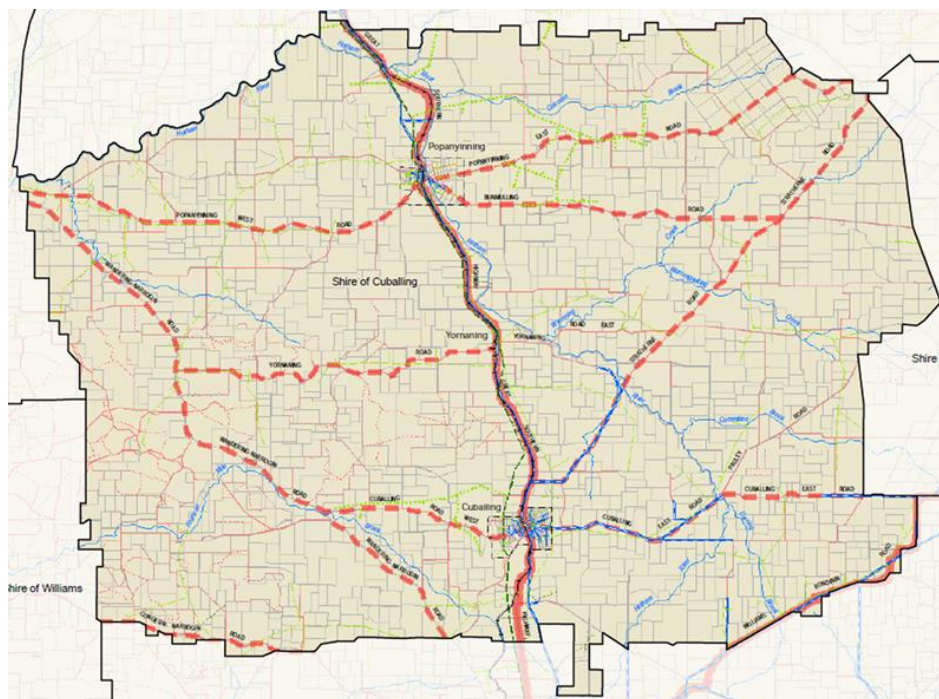


Figure 13: Shire of Cuballing Transportation Routes <sup>24</sup>

<sup>23</sup> Department of Primary Industries and Regional Development [www.agric.wa.gov.au](http://www.agric.wa.gov.au)

<sup>24</sup> Source: Shire of Cuballing Local Planning Strategy

Whilst the Australian Rail Corporation (ARC), through their own internal bushfire risk management project, have undertaken some fire mitigation work along their rail infrastructure, post incident debriefs from fires within the Shire in 2019, have raised concerns around the risks associated with the rail infrastructure. The Shire of Cuballing has commenced discussions with ARC as a result of post incident debrief findings as well as priorities already identified through this BRM Planning process.

Tourism is also a growing industry in Cuballing with the Dryandra State Forest a major drawcard with over 45 000 visitors recorded in 2009/2010.<sup>25</sup> The many heritage trails throughout the Shire provide an avenue for tourists to experience the local history and wildflowers.<sup>26</sup> This presents challenges to the Shire as previously outlined however a mitigation program throughout the Dryandra complex is managed by the Department of Biodiversity (DBCA) and Attractions including the maintenance of multiple escape routes throughout the Dryandra State Forest.

The Dryandra Regional Equestrian Centre is the location of many large-scale equestrian events throughout the year. Whilst this may increase the bushfire related risk, this risk is reduced to some degree as those involved in the equestrian events are known to be highly mobile and, if required, have the capacity to evacuate on short notice. The Shire also maintains low fuel zones around the Equestrian Centre.

Agriculture and associated fields account for most of the employment in the shire. This is reflected in *Figure 14*. As outlined above, the Agricultural industry is known to be impacted by fire events through both physical loss and post fire impacts such as soil erosion, and as such this is a significant consideration for the Shire’s fire management planning. The Shires Fire Break notice contains specific requirements related to agricultural operations.

Industry of employment, top responses <i>Employed people aged 15 years and over</i>	Cuballing (S)	%	Western Australia	%	Australia	%
Grain-Sheep or Grain-Beef Cattle Farming	39	12.3	4,107	0.4	15,056	0.1
Hospitals (except Psychiatric Hospitals)	20	6.3	41,706	3.6	411,808	3.9
Other Grain Growing	18	5.7	4,000	0.3	19,053	0.2
Secondary Education	17	5.4	20,488	1.8	177,487	1.7
Sheep Farming (Specialised)	12	3.8	2,232	0.2	18,197	0.2

Of the employed people in Cuballing (S) (Local Government Areas), 12.3% worked in Grain-Sheep or Grain-Beef Cattle Farming. Other major industries of employment included Hospitals (except Psychiatric Hospitals) 6.3%, Other Grain Growing 5.7%, Secondary Education 5.4% and Sheep Farming (Specialised) 3.8%.

*Figure 14: Table reflecting the main Employment Industries* <sup>27</sup>

## 3.2 Description of the Environment and Bushfire Context

### 3.2.1 Topography and Landscape Features

The agricultural areas of Western Australia are very diverse, with a wide range of landscapes, soils and landscape features. The Shire of Cuballing’s landscape features are detailed in the Department of Agriculture and Food (WA) series ‘*Landscape and soils of the Narrogin District*’ 2010’, this includes the Shire of Cuballing.

The Shire of Cuballing is more defined in the west becoming flatter as you head east. Shaded areas in *Figure 15* highlight the three landscape categories in the Narrogin district, the Shire of Cuballing is located predominantly within the Rejuvenated Drainage Zone (RDZ). The RDZ has active river drainage systems that joins the Avon, Murray and Blackwood rivers. The landscape has variable soils formed from dissected laterites and underlying igneous rock. In the south there are some broad saline valleys.<sup>28</sup>

<sup>25</sup> Source: *Dryandra Woodland Management Plan No 70 2011*

<sup>26</sup> Source: *Shire of Cuballing Strategic Community Plan 2017 - 2027*

<sup>27</sup> Source: *ABS Census 2016*

<sup>28</sup> Source: *Landscape and soils of the Narrogin District, Dept of Agriculture and Food WA, 2010, Bulletin 4807*

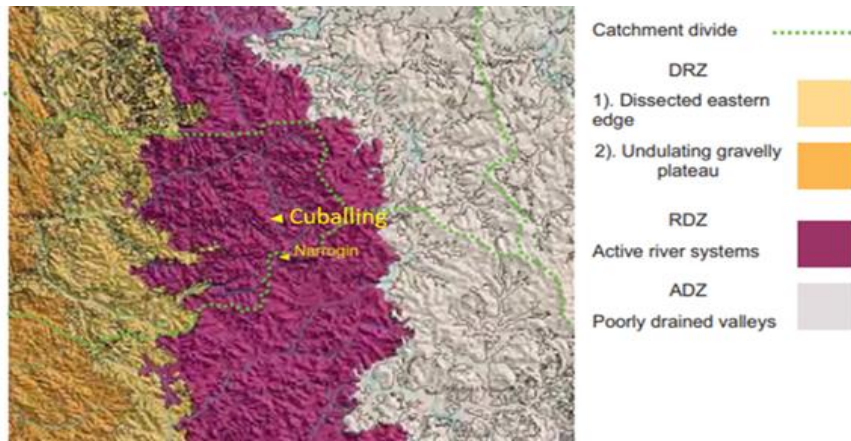


Figure 15: Landscape categories within the Shire of Cuballing <sup>29</sup>

The geology of southern Western Australia, including the Shire of Cuballing, is dominated by the Yilgarn Craton, an ancient plateau composed mainly of granite, with intrusions of dolerite and capped with laterite. The north-west alignment of major rock bands of the Yilgarn Craton reflects its formation over many hundreds of million years as ‘rafts’ of land on tectonic plates collided to form bands of gneiss that were intruded by granites. Gneiss is a metamorphic rock with a banded or foliated structure, typically coarse-grained and consisting mainly of feldspar, quartz, and mica. Extensive faulting and uplifts on the south and west of the Yilgarn craton caused marked changes to slope and drainage patterns. Stresses associated with these events caused cracking and intrusion of the dolerite dykes that occur throughout the craton. These dykes can be a locally significant as soil materials are frequently associated with mafic lateritic ridges. Bands of greenstone were formed when intra-plate rifts were alternately filled by sediments and volcanic rocks, and then also became extensively metamorphosed by ongoing plate collision. Igneous rocks include granite, dolerite, gabbro, quartz and metamorphic rocks such as gneiss, that are parent materials for wind and waterborne deposits, laterites and a range of soils. Outcrops are relatively common in dissected (rejuvenated) areas. *Figure 16* shows an example of a rocky landscape with mafic breakaway on the ridge and soils formed from granite (foreground) and dolerite dykes on the slope common in the west of the Shire. <sup>30</sup> *Figure 16* depicts a mafic mesa area within East Cuballing. ‘Mafic’, is an adjective describing a silicate mineral or igneous rock that is rich in magnesium and iron, with mafic minerals crystallizing at higher temperatures. ‘Mesa’ is defined as an area with an isolated flat-topped hill with steep sides, found in landscapes with horizontal strata. <sup>31</sup>

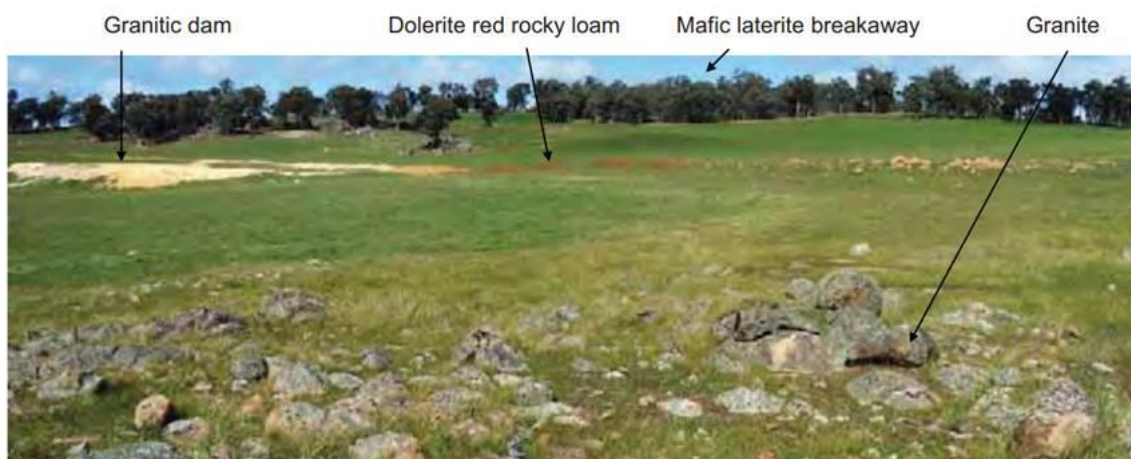


Figure 18: Mafic Landscape Views <sup>32</sup>

<sup>29</sup> Source: *Landscape and soils of the Narrogin District, Dept of Agriculture and Food WA, 2010, Bulletin 4807*

<sup>30</sup> Source: *Landscape and soils of the Narrogin District, Dept of Agriculture and Food WA, 2010, Bulletin 4807*

<sup>31</sup> Source: *Landscape and soils of the Narrogin District, Dept of Agriculture and Food WA, 2010, Bulletin 4807*

<sup>32</sup> Source: *Landscape and soils of the Narrogin District, Dept of Agriculture and Food WA, 2010, Bulletin 4807*



Figure 16: Mafic Landscape Views – An area in East Cuballing reflecting mafic mesa <sup>33</sup>

Topography can significantly impact the bushfire behaviour, impeding access for suppression resources and limiting options for mitigation works which makes it a significant factor in bushfire risk and management. The impact of topography is greater in the West of the Shire of Cuballing where the rock outcrops can restrict and, in some cases, prevent access by fire appliances. In areas where the rocky formations prevent ground-based firefighting, direct attack of a fire is limited to aerial response or alternatively, ground crews waiting for access when the fire reaches an area of suitable topography. This method however, greatly increases the time for fire to be suppressed which means fires have time to grow resulting in larger fires often with higher intensities and rates of spread. When fighting larger more intense fires, alternate methods of fire control may be required. For example constructing firelines (tracking), around the perimeter of the fire, through the use of heavy machinery or by lowering fuels through methods such as backburning. ‘Tracking’ is a form of direct attack that can minimise the final fire area. An indirect attack, such as backburning, may increase the overall fire size. While land formations can make installing firebreaks and firelines challenging, this issue highlights the need to ensure good strategic fire breaks are created ahead of time, which can be used to contain fires in this more difficult terrain. Environmental impacts, such as impacts to remnant vegetation, can be best managed by strategic fire access tracks. Fire access tracks are relatively less effective when suppressing larger more intense fires however are preferable to provide safe, effective and quicker access and therefore improve the ability to control a fire whilst small.

The western portion of the district is located on the Darling Plateau and the eastern section contains flat floored valleys. The district’s landscape is dominated by a system of valleys associated with the Hotham River and its tributaries as reflected in *Figure 17* below. There are various other waterways within the district including Fourteen Mile Brook and Calcoran Brook. These valley formations result in slopes which can exceed 20 degrees. Slope has a major influence on fire behaviour, the rate of spread of a bushfire will double for each 10 degrees slope meaning a fire going up a 20-degree slope will move four times faster than on flat ground. Because of this, fires in these valley formations will often move very fast and can be difficult to stop.

The waterways in the Shire are often riparian vegetation corridors which creates areas where the vegetation is separated by rivers making movement across the landscape challenging. This is particularly the case for firefighters as fires often spot across the watercourses where firefighters cannot easily cross and they may have to travel some distance to be able to get to the other side. This can often result in a significant delay in firefighting response allowing the fires to be able to grow quickly.

<sup>33</sup> Source: *Landscape and soils of the Narrogin District, Dept of Agriculture and Food WA, 2010, Bulletin 4807*



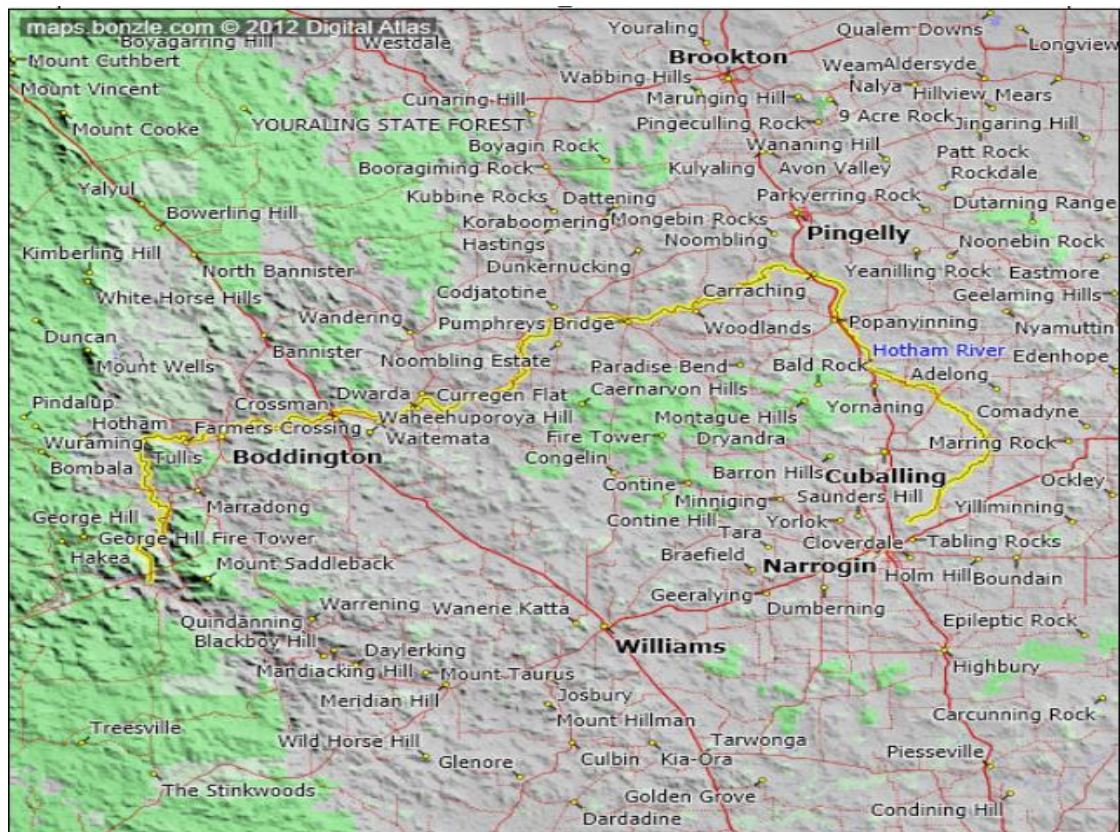


Figure 17: Tributaries of Hotham River<sup>34</sup>

Given the prevalence of waterways it is not surprising that there are 17 bridges throughout the Shire. These are critical features in the landscape, particularly for fire management. They are traffic routes, critical to tourism as well as the movement of agricultural produce and therefore the local and regional economy can be adversely affected if bridges are damaged/destroyed by fire. For fire management they are vital for the movement of firefighting response vehicles as well as the evacuation of communities when required. The BRM Planning process has identified the bridges, particularly timber bridges, as a strategic risk for the Shire and they will be a priority for mitigation works.

Embers can create spot fires ahead of a main fire front. This type of fire behaviour can increase the spread of fire and significantly increase risk to fire fighters and the community. The ability for embers to travel well ahead of the main fire is one reason land owners are encouraged to reduce fuels around their properties and remove items that may easily ignite from around their homes. Low fuel zones, such as 'Asset Protection Zones' around properties can contribute to reduced fire spread, can reduce the impact on assets, can result in less intense fire behaviour and ultimately a more successful fire response outcome. Installing and maintaining APZ's are a focus of the Shire's annual Fire Break Notice.

A major challenge for the shire is access and crossing landscape features during fire events, water way valleys, pipelines and the rail network all pose challenges to fire fighting vehicles moving through areas of the landscape. There is an above ground Water Corporation pipeline running north-south dissecting the Shire. This supplies water to the Shire of Cuballing as well as other surrounding Shires. This can restrict movement with limited crossovers accessible. This is a significant consideration and limitation when responding to fires but also when planning bushfire mitigation activities particularly in the context of risk management.

<sup>34</sup> Source: Bonzle Digital Atlas of Australia

### 3.2.2 Climate and Bushfire Season

The climate of the Shire is described as semi-arid, with a warm, dry, Mediterranean climate. It has seven to eight dry months each year with an annual average rainfall of about 500 millimetres. Seasonal changes in temperature, rainfall and wind direction are marked and more extreme than coastal areas of the south-west.<sup>35</sup>

The following weather statistics were obtained from the Bureau of Meteorology (BOM). Whilst there is evidence of a Weather Station in the Shire of Cuballing (Station ID 010538), statistics have not been kept consistently. The closest alternative weather station, with consistently recorded data, is Narrogin (Station ID 010614), 13 kms from the Cuballing town site. The Narrogin Station has been used to provide the following data.

Bushfire threat is typically associated with very hot (above average temperatures), dry (less than 20% humidity) and windy (above 12 – 15 Km per hour) conditions. *Table 4* shows that the Shire of Cuballing can experience these thresholds (as highlighted) throughout the year particularly during October to March inclusive. The wettest months are May through September when about 70% of the annual rainfall occurs. Weather is the primary influencer on fire activity<sup>36</sup> and therefore needs to be a significant consideration when planning both mitigation and response activities.

**Table 4– 2019 Climatic Conditions for the Shire of Cuballing<sup>37</sup>**

Month	Min temp °C	Max temp °C	Avg temp °C	Min RH %	Min avg RH %	Max avg RH %	Max RH %	Rain mm	Wind AvgSpeed @3m	Wind MaxSpeed @3m	Wind MaxCompass Point @3m	High wind days
Dec-19	8.6	41.9	24.5	5.4	15.9	73.7	95.7	1.8	12	60	NNW	21
Nov-19	1.8	40.9	19.2	7.9	20.5	84.1	97.8	12.6	13	60	SW	14
Oct-19	0.5	34	15.4	9.4	31.4	93	100	12.4	10	75	W	8
Sep-19	-1.4	28.7	13	16.1	43.3	97.4	100	17.2	8	50	NW	7
Aug-19	0.1	24.1	10.8	26.1	53.5	95.4	100	80.8	8	58	W	9
Jul-19	1.8	19.5	10.5	32.2	60.4	99	100	54.2	7	57	WSW	4
Jun-19	-0.6	23.2	11.2	12.3	52.3	91.2	100	120.6	9	66	N	11
May-19	-1.5	27.4	11.8	14.1	37.1	92.7	99.3	14.2	7	45	WSW	5
Apr-19	0.6	33.7	16.4	16.2	34.1	87.2	97.2	17	10	56	WSW	11
Mar-19	6.1	36.2	20.6	15.2	33.1	85.3	97.9	11.8	12	53	SE	10
Feb-19	9.2	40.2	22.6	9.9	21.5	81.3	93.1	0	14	60	SE	15
Jan-19	5.4	42.2	22.2	5.9	20.4	81.7	93.6	1.4	13	66	WNW	17

*Figures 18 and 19* reflect high summer temperatures, with both the mean minimum, and mean maximum, temperatures the highest from December through to March. *Figure 20* shows the mean maximum temperature, by month, during 2019 reflected against the mean maximum temperature and the highest and lowest mean maximum temperatures for all years. *Figure 21* reflects the mean rainfall over the years 1891 to 2019. Relative Humidity (RH) plays a big part in firefighting as the lower the relative humidity the more vigorously fuels can burn. *Figures 22 and 23* show the lowest RH's are recorded from December through to February. *Figures 18 through to 23* confirm the higher fire danger period in the Shire of Cuballing is between December through to February.

<sup>35</sup> Source: Bureau of Meteorology

<sup>36</sup> *The Burning Issue: Climate Change and the Australian Bushfire Threat* [www.climatecouncil.org.au](http://www.climatecouncil.org.au)

<sup>37</sup> Department of Agriculture and Food

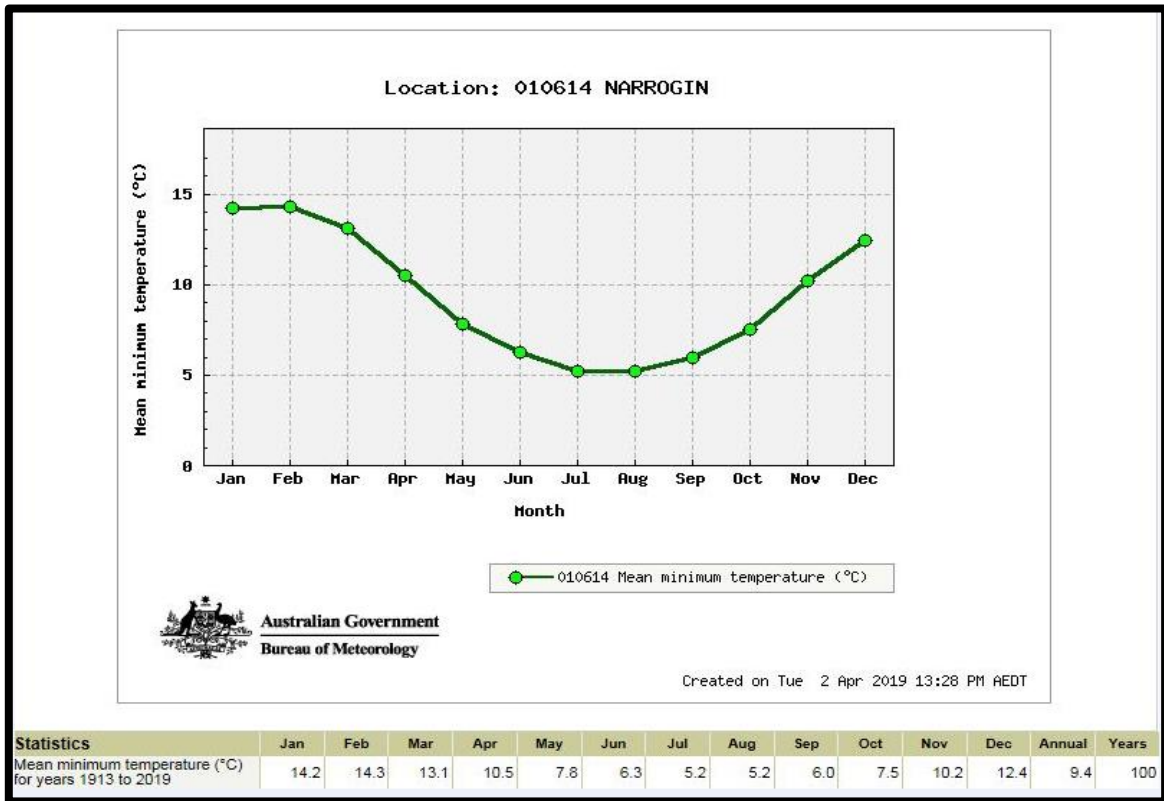


Figure 18 Graph depicting the mean minimum monthly temperate over the period 1913 – 2019. <sup>38</sup>

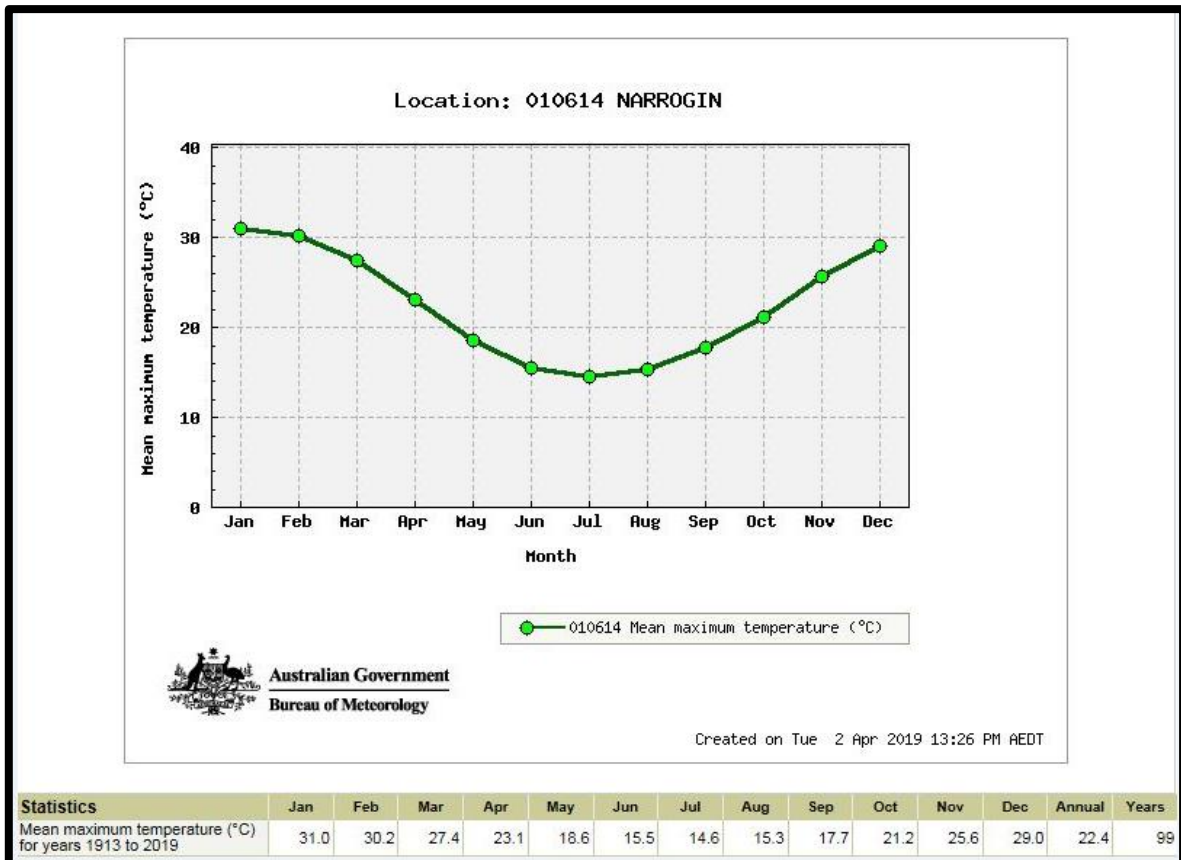


Figure 19: Graph depicting the mean maximum monthly temperate over the period 1913 – 2019. <sup>39</sup>

<sup>38</sup> Bureau of Meteorology

<sup>39</sup> Bureau of Meteorology

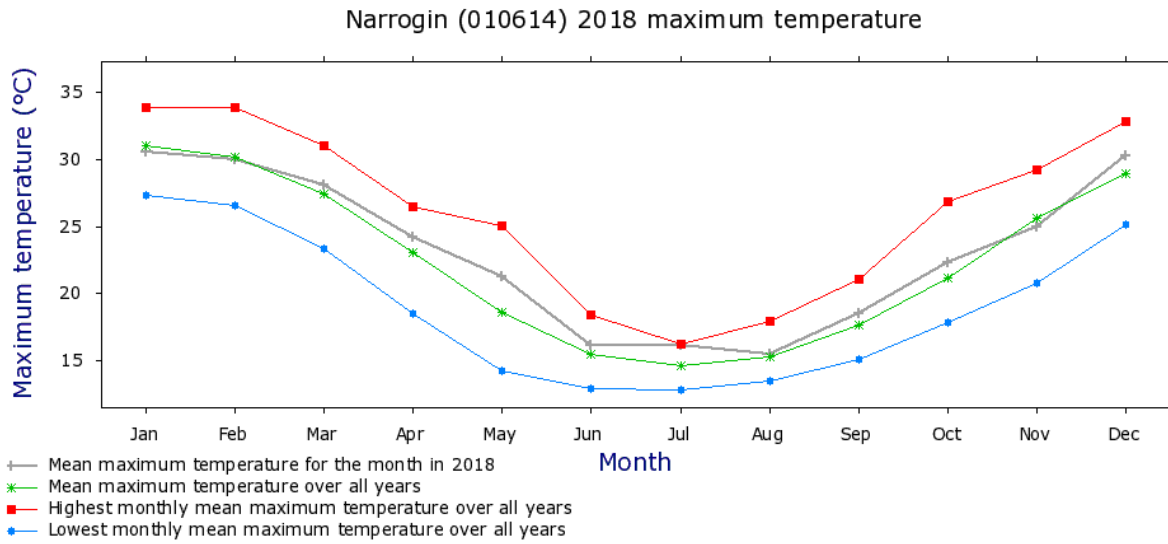


Figure 20: Graph depicting the mean maximum monthly temperate and the highest and lowest mean monthly temperature over all years in comparison to the mean maximum monthly temperatures during 2018.<sup>40</sup>

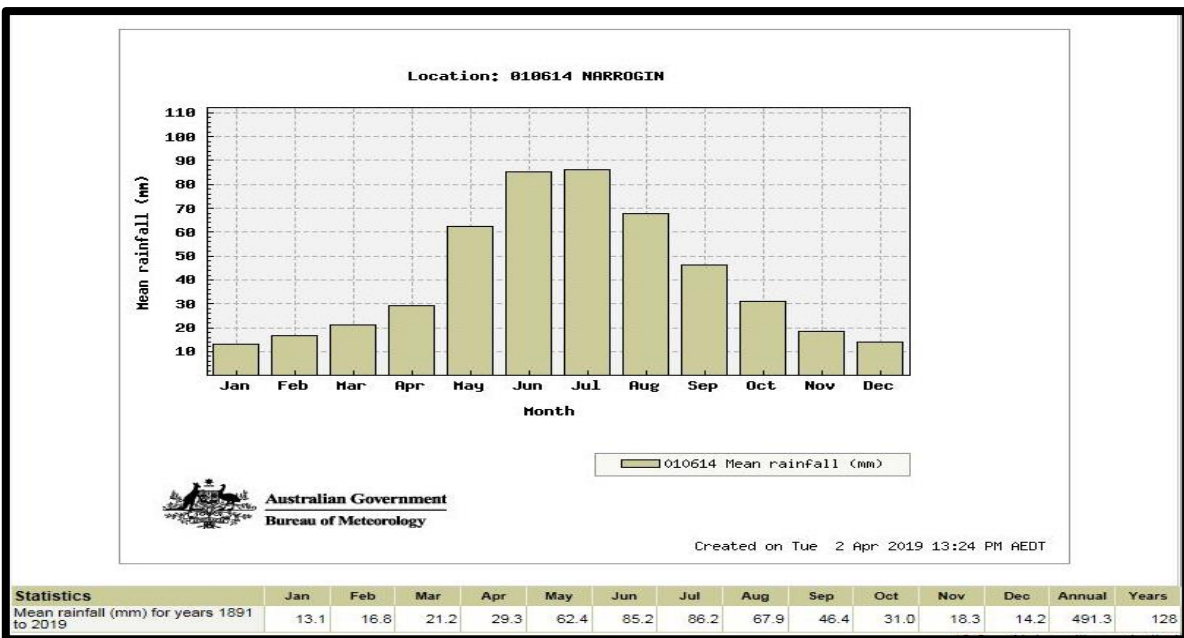


Figure 21: Graph depicting the mean rainfall between 1891 to 2019<sup>41</sup>

<sup>40</sup> Bureau of Meteorology

<sup>41</sup> Bureau of Meteorology

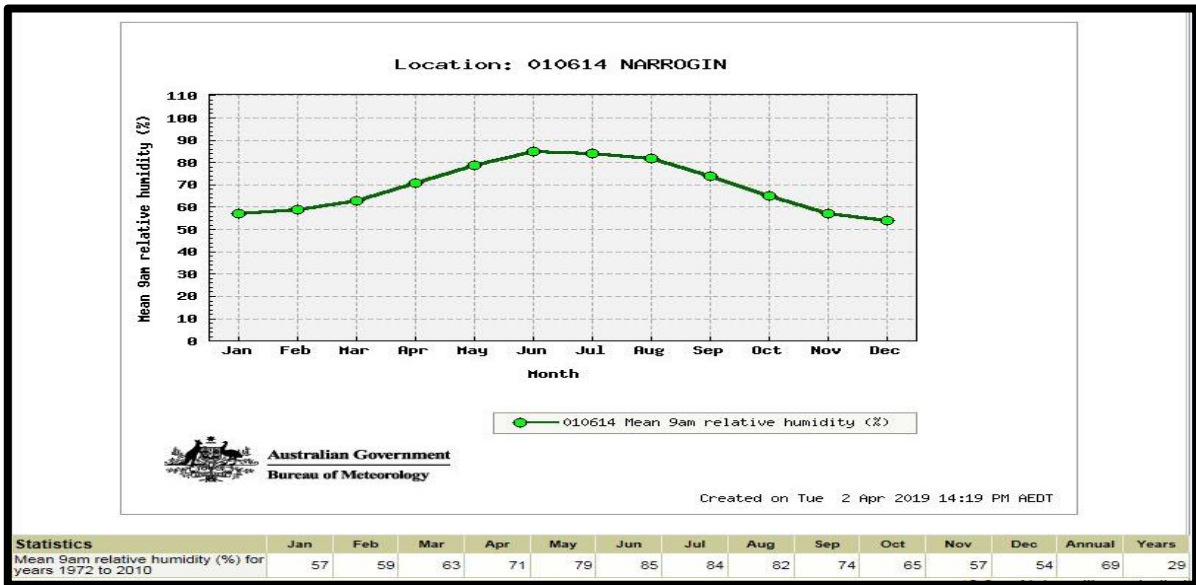


Figure 22: Graph depicting the 9am relative humidity for year 1972 to 2010 <sup>42</sup>

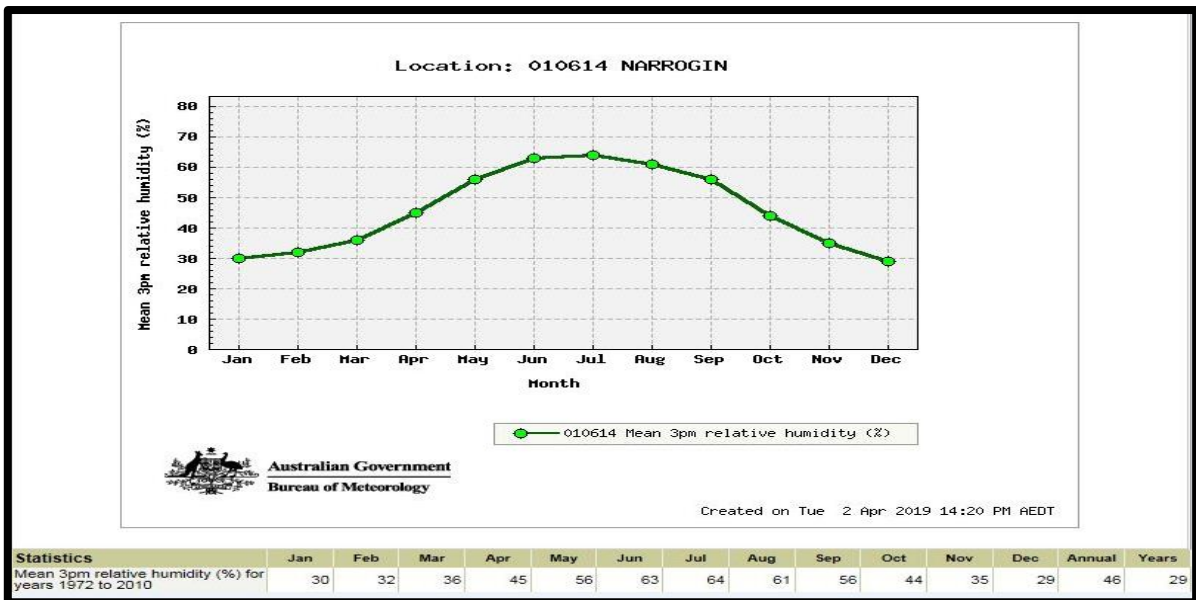


Figure 23: Graph depicting the 3pm Relative Humidity between 1972 to 2010 <sup>43</sup>

### Wind Direction and Speed

The following diagram (Figure 24) is a wind rose covering a twelve-year period 2007 – 2019 reflecting the prevailing winds for the Shire of Cuballing. Figure 25 reflects a series of wind roses covering the years 2016 – 2019 individually. Figures 25 and 26 show prevailing winds predominantly from the West (W), West South West (WSW), South East (SE) and East South East (ESE).

<sup>42</sup> Bureau of Meteorology

<sup>43</sup> Bureau of Meteorology

## Narrogin : Wind Rose 2007 - 2019

18-11-2007 - 18-11-2019

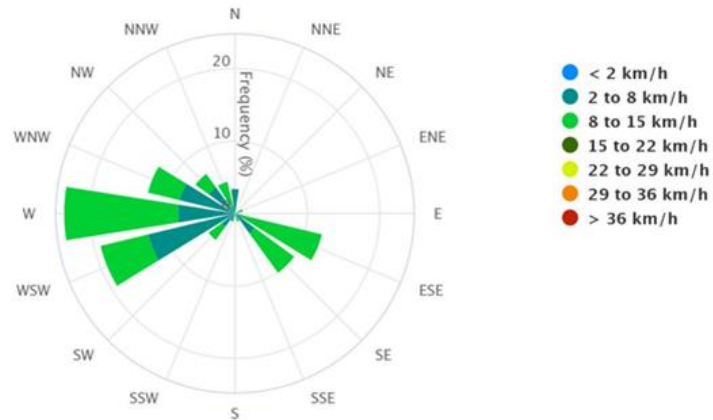


Figure 24: Wind rose reflecting predominant winds and wind speeds over the period 18 Nov 2007 – 18 Nov 2019 taken from the Dept of Agriculture Weather Station NA001. <sup>44</sup>

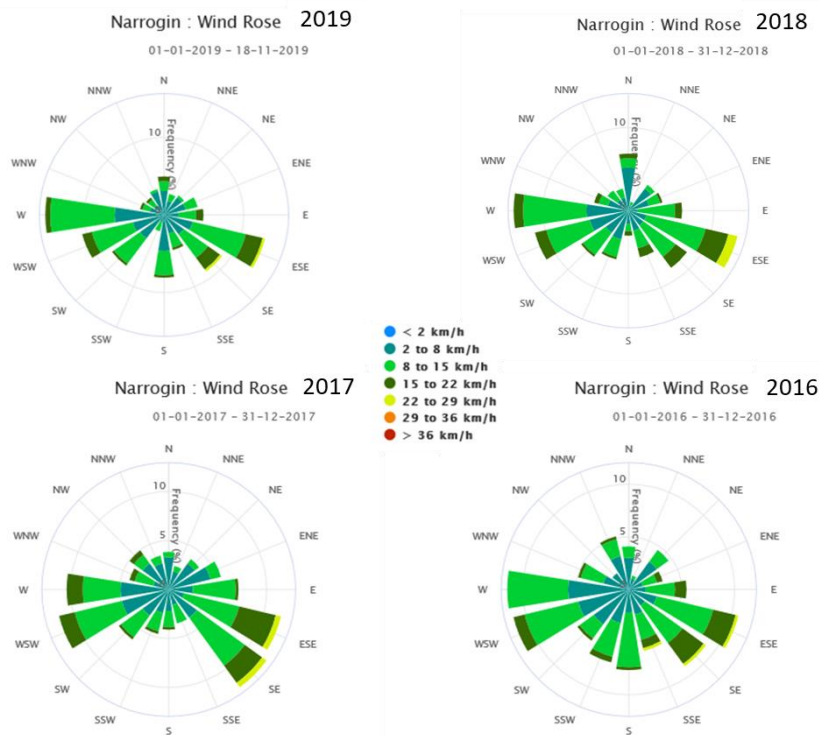


Figure 25: Wind roses reflecting the annual predominant winds and wind speeds for the years 2016 to Nov 2019 taken from the Dept of Agriculture Weather Station NA001. <sup>45</sup>

The following diagrams (figure 26) look at prevailing winds in the context of the hotter months corresponding with the peak of the fire season – January and February. These wind roses also indicate winds predominantly from the South-East, East South East and to a lesser extent from the West.

The prevailing winds within the Shire of Cuballing is known as the ‘Albany Doctor’ which comes from the South-East in the mid afternoon. This is well known by the fire response personnel and subsequently fire management strategies are developed with this in mind.

<sup>44</sup> Bureau of Meteorology

<sup>45</sup> Department of Agriculture and Food Weather Station Narrogin (NA001)

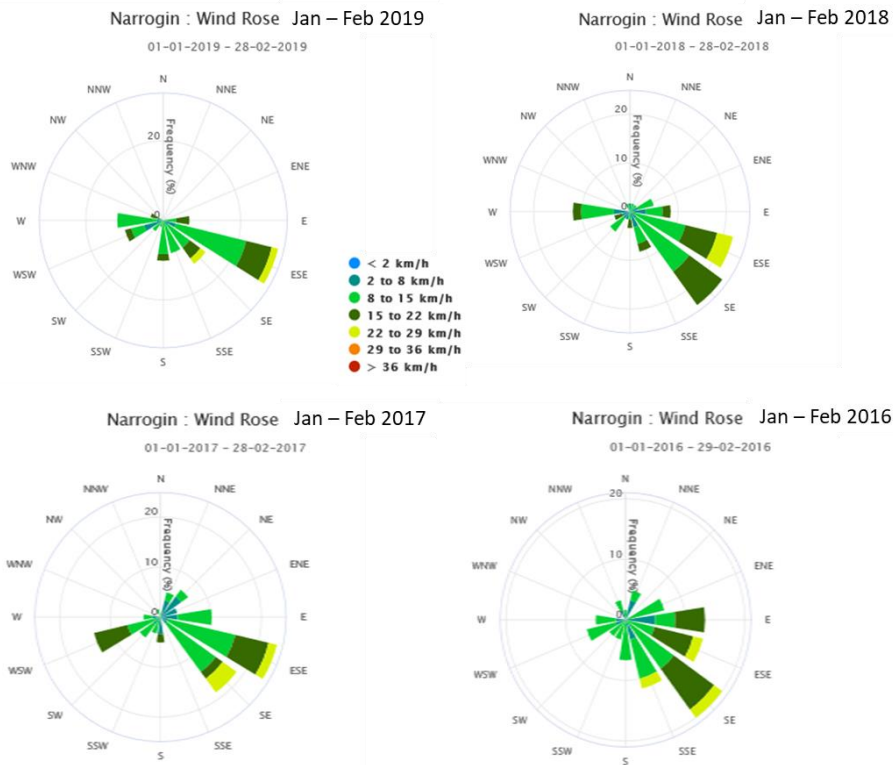


Figure 26: Graph depicting wind direction during the known hottest months (January and February) for the years 2016 to 2019 taken from the Dept of Agriculture Weather Station NAR001.<sup>46</sup>

Grassland fires can be particularly susceptible to the effects of wind and wind changes. Prevailing winds are a significant consideration in relation to both operational response as well as determining effective mitigation treatments.

### 3.2.3 Vegetation

The Shire of Cuballing vegetation types consist primarily of:

- Woodland  
Woodlands are characterised by Trees 10–30 metres high; 10–30% foliage cover dominated by eucalypts; understorey of low trees to tall shrubs typically dominated by Acacia, Callitris or Casuarina.
- Forest  
Trees 10–30 metres high; 30–70% foliage cover; (may include understorey of sclerophyllous low trees and tall scrubs or grass). Typically dominated by eucalypts.
- Shrubland  
Shrubs <2 metres high; greater than 30% foliage cover. Understoreys can contain grasses. Acacia and Casuarina often dominant in the arid and semi-arid zones
- Grassland  
All forms, including situations with shrubs and trees if the overstorey foliage cover is less than 10%. Also includes broadacre farming

The 2016 ‘Cuballing / Popanyinning Local Planning Strategy Bushfire Hazard Level Assessment’ (*Lush Fire and Planning, November 2016*) offers a useful map of the Cuballing and Popanyinning townsites with the respective vegetation classifications. These are shown at *Figures 27 and 28*:

<sup>46</sup> Department of Agriculture and Food Weather Station Williams (WL001)

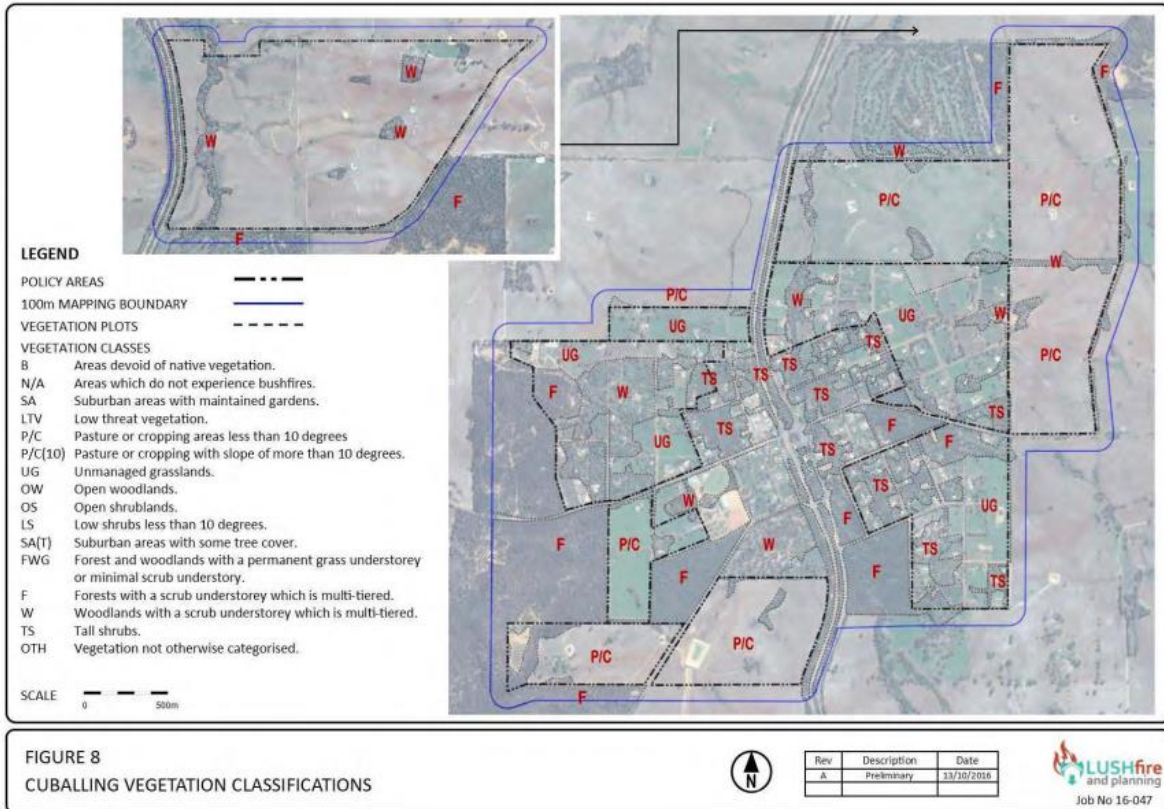


Figure 27: Vegetation Classifications within the Townsite of Cuballing<sup>47</sup>

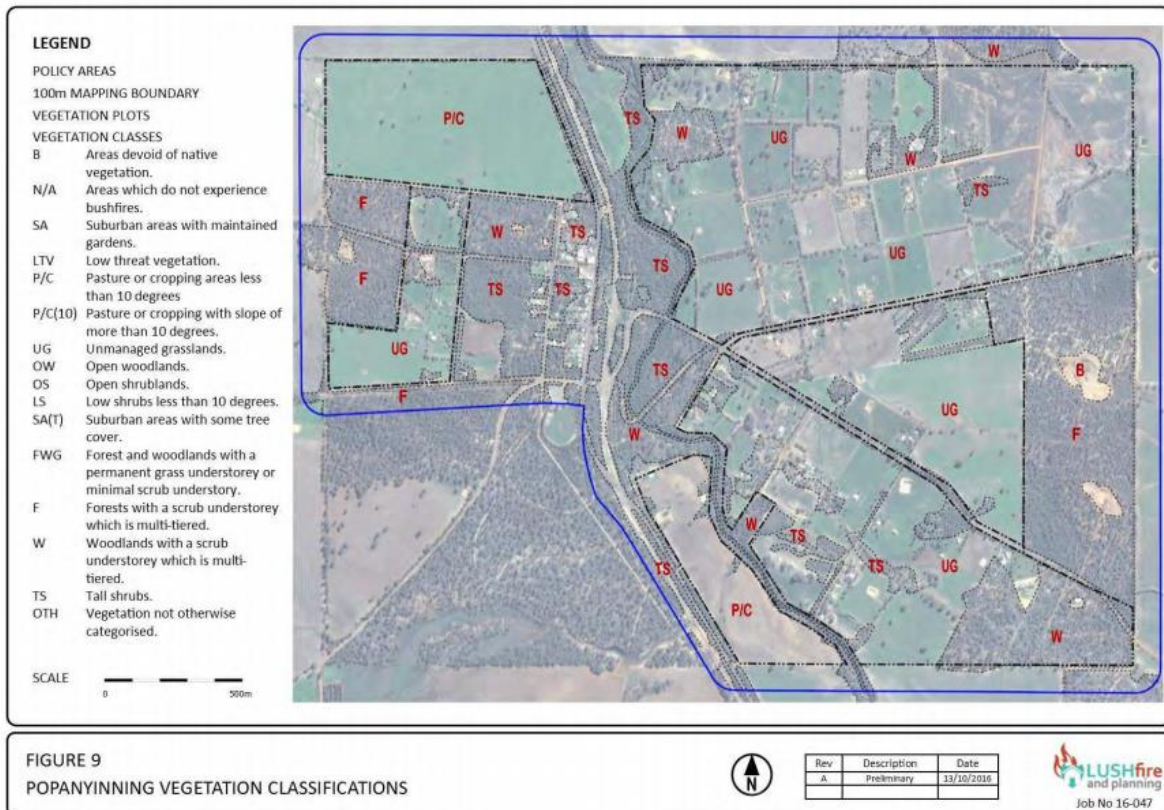


Figure 28: Vegetation Classifications within the Townsite of Popanyinning<sup>48</sup>

<sup>47</sup> Source: Shire of Cuballing Local Planning Strategy

<sup>48</sup> Source: Shire of Cuballing Local Planning Strategy



Large portions of the Shire are dominated by agricultural land use and the natural vegetation has been extensively cleared.

The most prevalent vegetation through the Shire is Eucalyptus, Allocasuarina (Sheoak) and Acacia acuminata (Jam Trees/Raspberry Jam Wattle).

Whilst agricultural holdings (grassland) may appear to be a low bushfire risk, this vegetation presents a significant bushfire hazard, especially during harvest season (November to January) when harvesting activities have the potential to ignite a fire in fully cured crops. The impact of wind on open terrain regardless of whether it is under crop, should not be underestimated. Fortunately, the landscape in much of the agricultural tenure is gently undulating with broad fields and only scattered remnant vegetation, making access for firefighting appliances easier.

The Dryandra Woodland is a nature conservation area within the Shires of Cuballing, Williams and Wandering featuring the largest remnant of original vegetation in the western Wheatbelt. Part of Dryandra Woodland is listed on the Register of the National Estate by the Australian Heritage Council.

Of the 28,000 ha of Dryandra State Forest, 17,500 ha is in the Shire of Cuballing. The Dryandra State Forest is a rare remnant of the open eucalyptus woodlands that covered the area before clearing for agriculture. Past weathering in the Dryandra area has produced a gently undulating countryside. With individual blocks ranging in size from 87 hectares to 12,283 hectares, the 17 lots that make up the Dryandra Woodland are surrounded by a largely cleared and agricultural landscape. In some cases, road reserves and other linking corridors of uncleared vegetation remain between the woodland islands. Some neighbouring landowners have revegetated areas of previously cleared private land to form additional corridors between these remnants.<sup>49</sup>

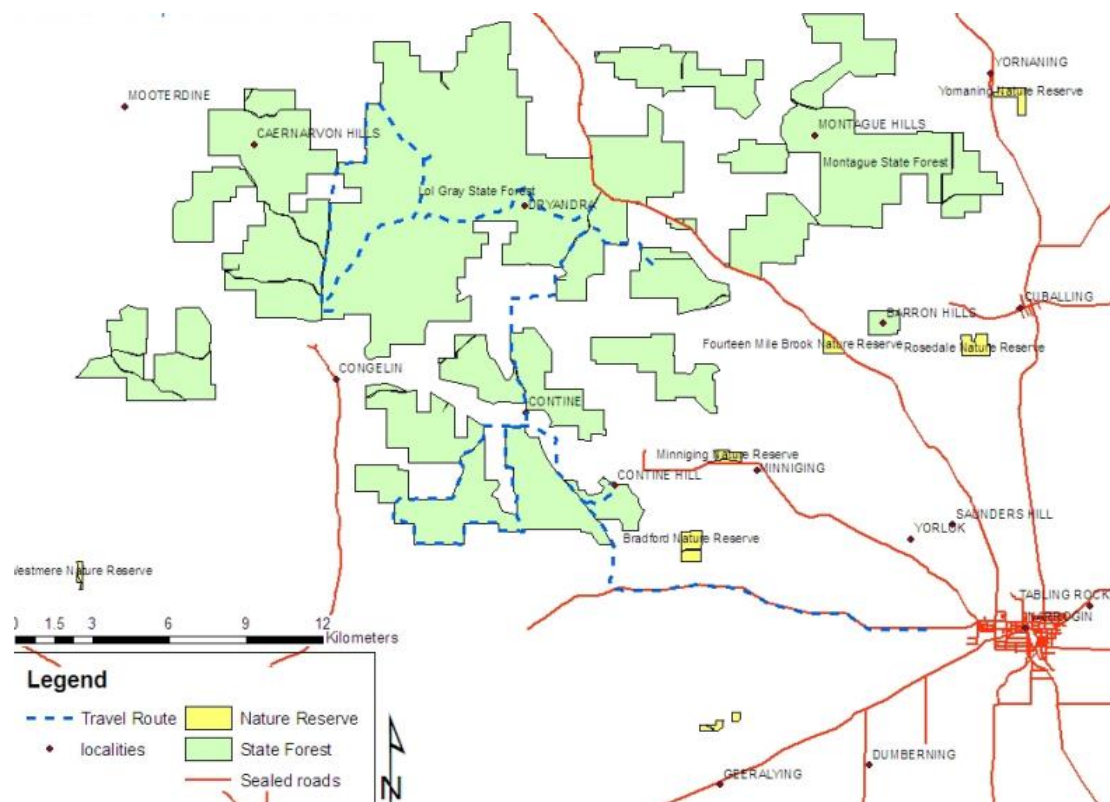


Figure 29: Map showing the blocks that make up the Dryandra Woodland<sup>50</sup>

<sup>49</sup> Source: Wikipedia – Dryandra Woodland

<sup>50</sup> Source: Wikipedia – Dryandra Woodland

The Woodland lies close to the boundary between the Mallee and Avon Wheatbelt biogeographic regions. Dryandra's flora is transitional between that of the moister jarrah forest (generally to the south) and the semi-arid Wheatbelt (to the east). It is known particularly for its extensive stands of Wandoo (*Eucalyptus wandoo*), Powderbark Wandoo (*E. accedens*) and Salmon White Gum (*E. lane-poolei*) and provides a haven for native flora and fauna.

Stands of Jarrah (*E. marginata*) and Marri (*Corymbia calophylla*) provide additional top cover, and the understorey contains Rock Sheoak (*Allocasuarina huegeliana*) and extensive areas of Banksia ser. Dryandra. Until early 2007 this latter shrub was classified as a separate genus Dryandra after which the woodland is named. Species include golden Dryandra (*Banksia nobilis*) and prickly Dryandra (*B. armata*).

Vegetation is one of the most significant influencers on fire risk and subsequent mitigation strategies. Further details about the indicative vegetation in the Narrogin District, encompassing Cuballing, is located at **Appendix 3**.

Three (3) aspects of vegetation within the Shire of Cuballing that requires specific attention, particularly in the context of bushfire mitigation treatment options moving forward, are:

1. The ability for sheoak – e.g. *Allocasuarina huegeliana* to invade into other native vegetation, significantly changing the vegetation and fuel structure. This is a common concern across the region with areas being significantly affected over time and, in the shorter term, from post fire regeneration
2. The importance of managing annual weeds in remnant vegetation and the opportunity for these weeds to become established post mitigation works. Burning small remnants in the wrong way, wrong time and wrong frequency can potentially result in higher fuel loads.
3. Waterways, particularly those in and around assets, are significant as they offer riparian vegetation corridors which produce a wick-like effect and are often associated with fire runs with marked changes in fire behaviour, intensity and spread expected in this vegetation.

### Environmental Considerations – Flora and Fauna

Flora and Fauna represent significance for the Shire as they are not only recognised environmental assets, but also impact the treatment options available for identified risks in relation to other assets. For example, the breeding cycle of some threatened fauna, such as Numbats, may restrict the period in which prescribed burns can be undertaken due to the need to ensure nests are not disturbed during the breeding season.

All treatments need to consider the requirements of the flora and fauna on site. Response strategies should be environmentally sensitive within the constraints of the incident. The Shire will take every opportunity to remind landowners/managers of their obligation to obtain appropriate clearances and approvals prior to commencing vegetation-based treatments.

A further consideration in relation to both bushfire prevention and response strategies is the potential spread of weeds or diseases such as *Phytophthora Cinnamomi* (Dieback). It is easily spread through moist soil movement from vehicles, animals, water and feet. Other fungal-borne diseases can also be spread through these pathways. This risk must be considered in the context of planned prevention and response strategies and the risk minimised wherever possible.

A list of the Declared Rare Flora and Declared Rare Fauna applicable to the Shire of Cuballing is included at **Appendix 4**. The map below (*Figure 30*) shows the indicative location of endangered flora and fauna within the Shire noting the significant concentration in the Dryandra Woodlands on the Western boundary of the Shire.

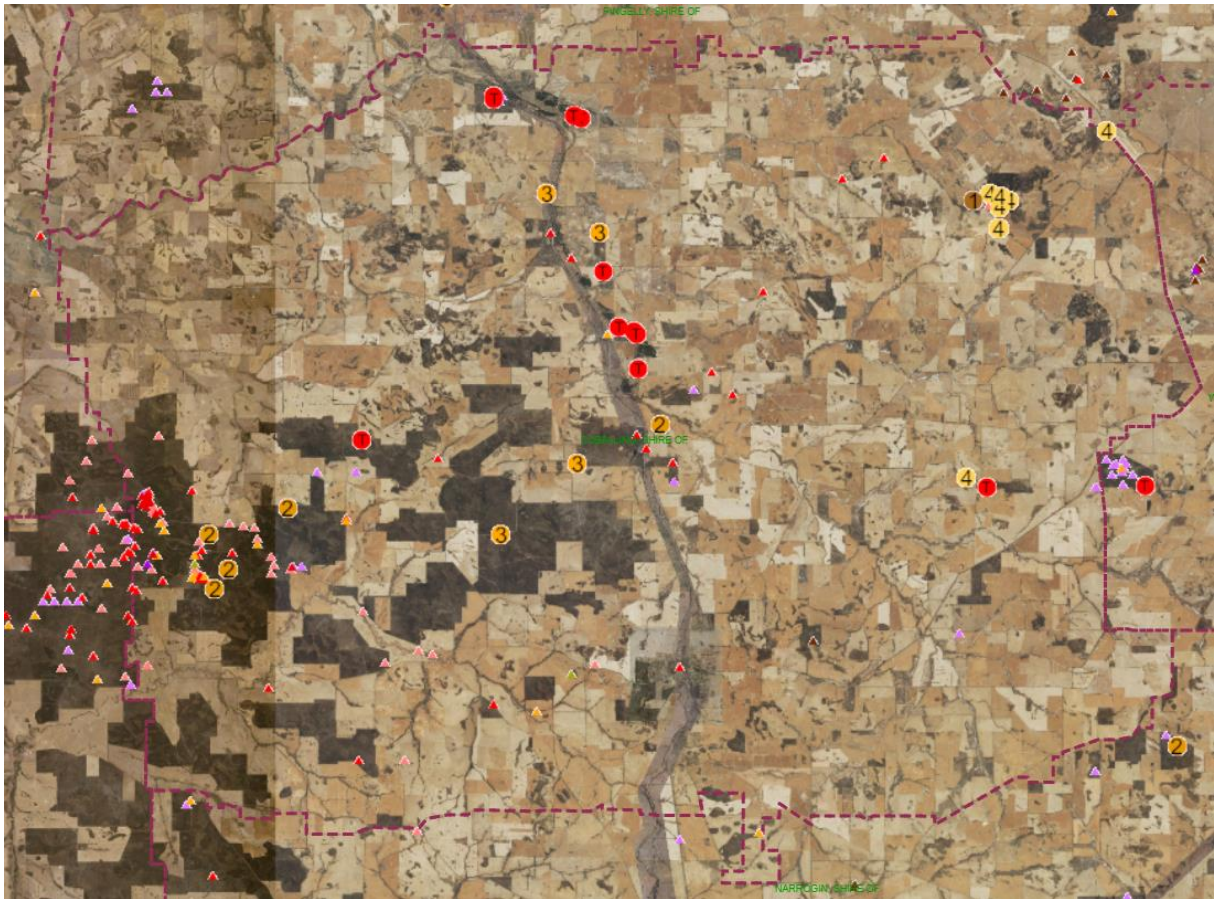


Figure 30: Map reflecting the indicative locations of endangered flora and fauna in the Shire of Cuballing<sup>51</sup>

### Threatened Ecological Communities

The Shire of Cuballing is within the catchment of the *Eucalypt Woodlands of the Western Australian Wheatbelt Ecological Community* (see Figure 31 below). The *Eucalypt Woodlands of the WA Wheatbelt* has been registered as a federally listed Threatened Ecological Community (TEC) and is a registered Matter of National Environmental Significance (MNES) which provides unique national environmental protections.



Figure 31: Open Eucalyptus Woodland<sup>52</sup>

<sup>51</sup> Source: DFES Bushfire Risk Management System

<sup>52</sup> Source: Department of Biodiversity Parks and Attractions

A TEC is “a community presumed to be totally destroyed or at risk of becoming totally destroyed.”<sup>53</sup> Being listed as a TEC offers the vegetation protections under the *Environment Protection and Biodiversity Conservation Act 1999*. The following map (Figure 32) depicts the coverage of the TEC which reflects a concentration in the Dryandra Woodlands.

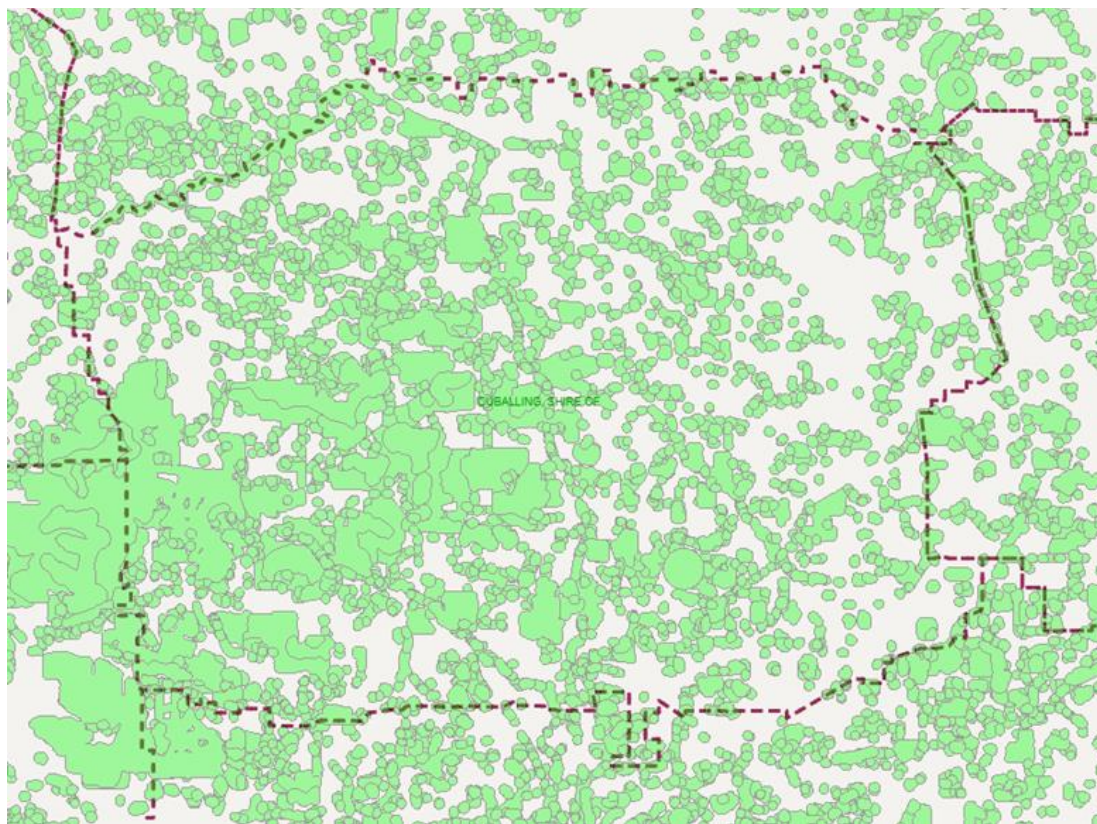


Figure 32: Map reflecting the coverage of the Eucalypt Woodlands of the Western Australian Wheatbelt Threatened Ecological Community<sup>54</sup>

The *Approved Conservation Advice (including listing advice) for the Eucalypt Woodlands of the Western Australian Wheatbelt* notes that altered fire regimes, notably changed fire frequency, but also changes to fire intensity and season, (such as occurs during prescribed burning) is a key threat to the ecological community. This indicates that there is a risk that a prescribed burn may have a significant impact on the threatened community, however, the Conservation Advice also notes that the response of the TEC to fire is site specific, that the TEC can benefit from an appropriate fire regime and that many responses to fire disturbance can be relatively temporary and/or minor. Therefore, when planning treatments on tenure within the TEC catchment, particularly prescribed burns, the following should be considered:

- the extent to which the proposed clearing or controlled burn will remove or substantially damage tall *Eucalypt* trees which are a key component of the Eucalypt Woodlands TEC
- the extent to which the understory is likely to be impacted and/or recover after the fire event
- whether there is a risk that the controlled burn or clearing will facilitate the invasion and/or spread of fast colonising weed species benefiting from the temporary reduction in vegetative competition

- control measures to implement to prevent the fire from intensifying or spreading; noting that a ‘hot’ burn is likely to substantially alter the vegetative structure or change the nature of the understory of the TEC (e.g. high intensity fires can scar trees allowing entry of wood decaying fungi)
- whether fire sensitive eucalypts, such as gimlet or salmon gums are present.

## Fauna

Major populations of three nationally endangered species exist within the Shire of Cuballing, centred on the Dryandra Woodlands: the Woylie (*Bettongia penicillata*), the Red-Tailed Phascogale (*Phascogale calura*) and over 50 percent of the total known population of the Numbat (*Myrmecobius fasciatus*).<sup>55</sup>



Figure 33: Picture of the nationally endangered Numbat (*Myrmecobius fasciatus*).<sup>56</sup>

Threatened fauna receive extra protection within a number of animal sanctuaries located throughout the Dryandra Woodlands. One such sanctuary, ‘Barna Mia’, is a public education program open to visitors by appointment for nocturnal tours. Native marsupial fauna includes the Woylie (*Bettongia penicillata*), Bilby (*Macrotis lagotis*), Mala (*Lagorchestes hirsutus*), Boodie (*Bettongia lesueur*), and Marl (or western barred bandicoot: *Perameles bougainville*).<sup>57</sup>

### 3.2.4 Bushfire Frequency and Causes of Ignition

DFES records show that from 1/07/2008 – 30/06/2019, a total of 47 incidents were reported in the Shire of Cuballing, reflecting on average 5 per year. Anecdotal evidence would suggest that this figure may not be accurate with the local belief that there have been other non-reported fires. Recent education of local fire management personnel has seen an increase in credibility of fire reporting. Ongoing education is planned, through pre-fire season briefings, to ensure ongoing accuracy of reportable incidents.

<sup>55</sup> Source: Wikipedia – Dryandra Woodland

<sup>56</sup> Source: Wikipedia – Dryandra Woodland

<sup>57</sup> Source: Wikipedia – Dryandra Woodland

Table 5 – Reported landscape fires in the Shire of Cuballing 2008 – 2019 <sup>58</sup>



Government of Western Australia  
Department of Fire & Emergency Services



**All Bushfires**  
LGA of CUBALLING (S)  
from 01/07/2008 to 30/06/2019

A Bushfire is considered to be any vegetation fire (bush, grass, scrub, forest): of any size

Bushfires Summary of Ignition for CUBALLING (S)	2008/2009	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	Total
<b>Total Number of Bushfires:</b>	<b>4</b>	<b>12</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>5</b>	<b>2</b>	<b>8</b>	<b>2</b>	<b>4</b>	<b>47</b>
Burn off fires	0	0	0	1	0	0	0	0	1	0	1	3
Campfires/bonfires/outdoor cooking	0	0	0	1	1	0	0	0	1	0	0	3
Cigarette	0	0	0	0	0	0	0	1	2	0	0	3
Equipment - Mechanical or electrical fault	0	1	0	0	0	0	0	0	0	0	0	1
Hot works (grinding, cutting, drilling etc.)	1	0	0	0	0	0	0	0	0	0	0	1
Reignition of previous fire	0	0	0	0	0	0	0	0	0	1	1	2
Suspicious/Deliberate	1	0	0	0	0	0	2	0	1	0	1	5
Undetermined	0	2	0	0	0	0	0	0	0	0	0	2
Unreported	1	0	3	0	2	0	0	0	0	0	0	6
Vehicles (incl. Farming Equipment/Activities)	0	2	0	0	0	0	1	0	2	0	1	6
Weather Conditions - Lightning	1	7	0	1	0	1	2	1	0	1	0	14
Weather Conditions (High winds, natural combustion etc. Excludes Lightning)	0	0	0	0	0	0	0	0	1	0	0	1

On review of the above ignition data it is indicated that “Weather Conditions – Lightning strikes” are the most frequent cause of bushfire within the Shire. Local fire personnel make use of new technology such as phone apps (Lightening Tracker) to monitor lightning strikes and forward deploy personnel to conduct ‘on group’ checks. Bureau of Meteorology Weather Warnings are also widely circulated to fire personnel. Agricultural related vehicle fires are the next most frequent, this challenge is largely addressed by council bylaws outlined in the Shires Firebreak Notice as well as Harvest and Vehicle Movement Bans.

The distribution of fires, as shown in Figure 34, reflects that fires are not concentrated in any area of the Shire.

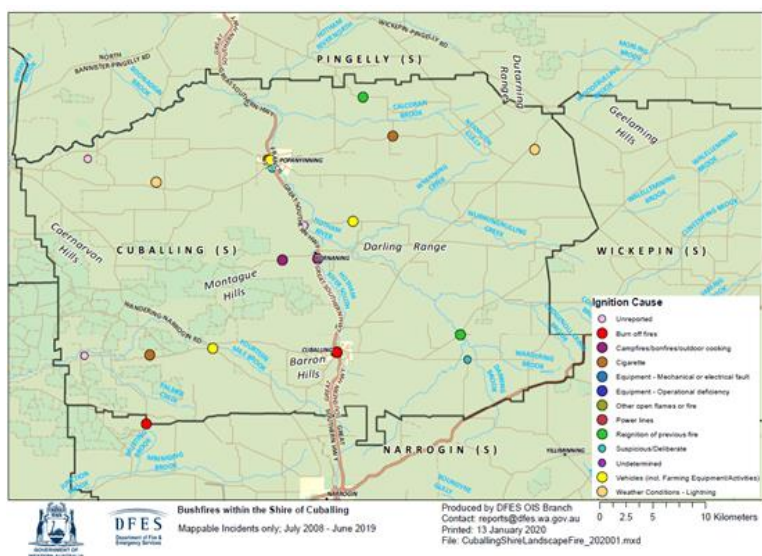


Figure 34 - Map reflecting the location of recorded fires within the Shire of Cuballing <sup>59</sup>

<sup>58</sup> Source: Department of Fire and Emergency Services

<sup>59</sup> Source: Department of Fire and Emergency Services

### 3.2.5 Current Bushfire Management Activities

#### Bushfire Control Activities

The *Bush Fires Act 1954*, sections 17 and 18, provides for the ‘declaration and gazettal’ of Prohibited and Restricted Burning Times as well as the ability to adjust burning times to suit changing weather conditions.

The Shire of Cuballing Restricted and Prohibited Burning times are as follows, subject to possible variation depending on each bushfire season with the Shire also imposing an annual ban during the festive season:

- 1<sup>st</sup> October to 31<sup>st</sup> October: Restricted (permits required)
- 1<sup>st</sup> November to 1<sup>st</sup> March: Prohibited
- 2<sup>nd</sup> March to 19<sup>th</sup> April: Restricted (permits required)
- Festive season automatic harvest bans: 25<sup>th</sup> of December and 1<sup>st</sup> of January each year.<sup>60</sup>

#### Local Planning Strategy

The WA Planning Commission endorsed the Shire of Cuballing Local Planning Strategy in June 2019, that includes the following in relation to bushfire:

##### 2.6.1 Bushfire

*‘Reducing vulnerability to bushfire is the collective responsibility of State and local government, landowners, industry and the community. It requires ongoing commitment and diligence to a range of management measures such as the appropriate location and design of development, managing potential fuel loads, implementing bushfire management plans; providing emergency services, increasing awareness of the potential risk through education; and ensuring evacuation plans are in place. Such measures, in conjunction with planning policy and building controls, have the effect of increasing community resilience to bushfire.’*

*Decision making authorities should seek to minimise the potential for property and lives to be put at risk from bushfire. This can be done by:*

- (a) not placing people, property and infrastructure in areas of extreme bushfire risk;*
- (b) reducing vulnerability to bushfire through the identification and assessment of bushfire hazards and risks at all stages of the planning process;*
- (c) ensuring subdivision, development and land use proposals take into account bushfire protection requirements and include bushfire protection measures; and*
- (d) taking a responsible, balanced approach between bushfire risk management and management measures, and landscape, amenity and biodiversity conservation objectives.*

*Broad-scale mapping of bushfire prone areas indicates that large parts of the district are bushfire prone. In this respect, any proposal to rezone, subdivide or develop land in a bushfire prone area will need to be accompanied by a bush fire management plan or associated assessment that demonstrates how the risk of bushfire can be mitigated in accordance with WAPC policy. The Shire has commissioned a bushfire hazard level assessment.*

##### 2.6.3 Key Hazard Issues

- (i) The significant bushfire risk within the district needs to be managed at each stage of the planning process by decision making authorities and landowners.<sup>61</sup>*

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<sup>60</sup> Source: Shire of Cuballing Bush Fire Notice 2017/2018

<sup>61</sup> Source: Shire of Cuballing Local Planning Strategy, June 2019

The Shire of Cuballing Planning Strategy includes reference to “Local Planning Strategy Bushfire Hazard Level Assessment” (Lush Fire & Planning, November 2016).<sup>62</sup> Mainly focused on the townsites of Cuballing and Popanyinning, this 2016 assessment is congruent with the risk assessments and ratings completed in the development of this BRM Plan. The following diagrams, *Figures 35 and 36*, depict the extreme hazard areas as identified in the “Local Planning Strategy Bushfire Hazard Level Assessment”.

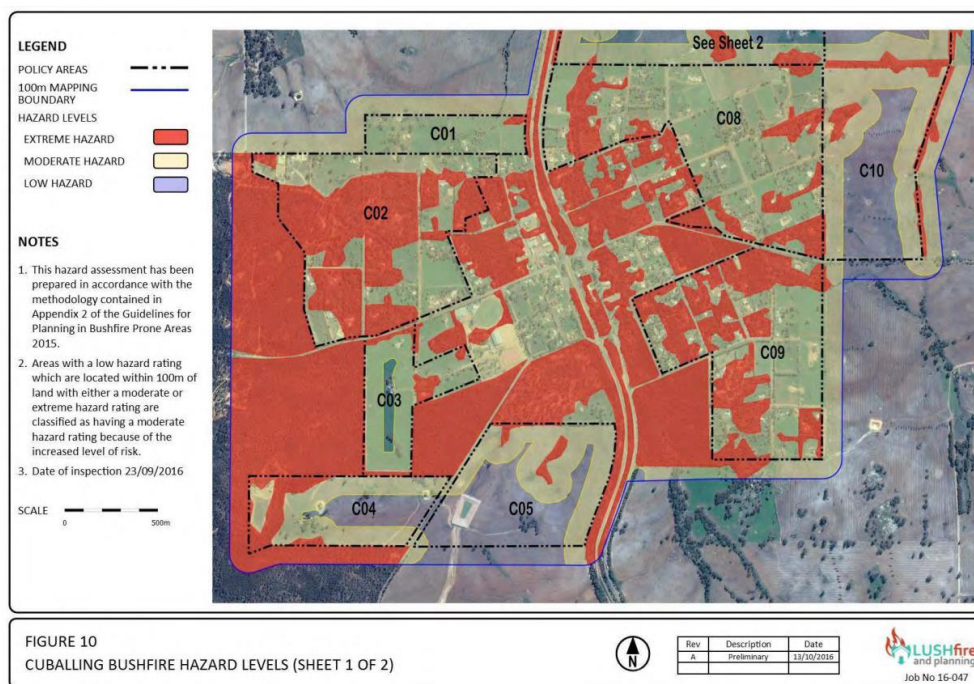


Figure 35– Bushfire Hazard Levels within the Townsite of Cuballing<sup>63</sup>

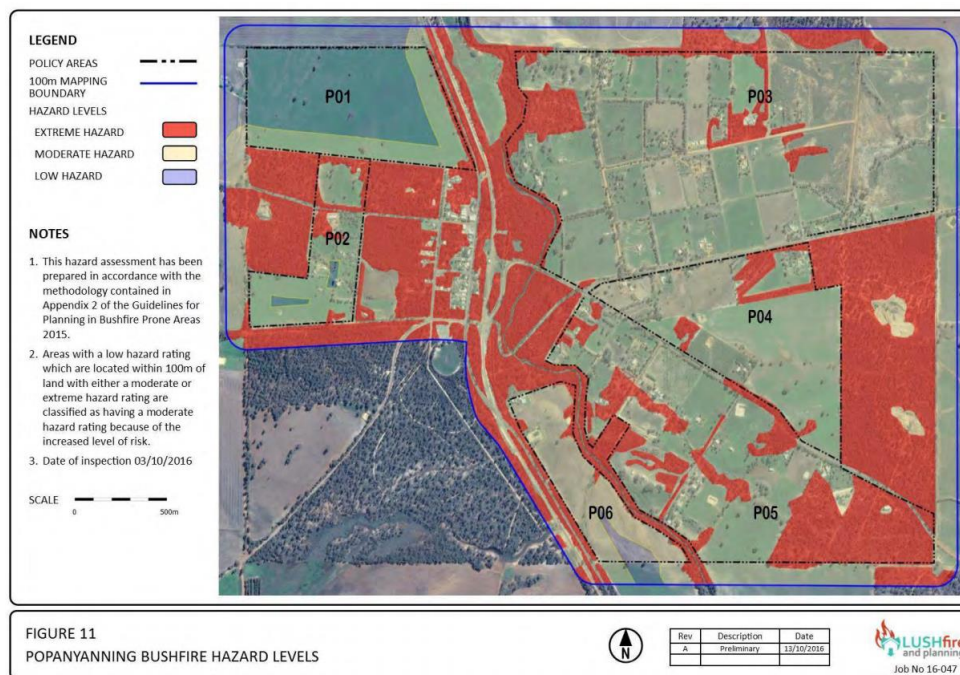


Figure 36 – Bushfire Hazard Levels within the Townsite of Popanyinning<sup>64</sup>

<sup>62</sup> Source: Shire of Cuballing Local Planning Strategy, June 2019

<sup>63</sup> Source: Cuballing / Popanyinning Local Planning Strategy Bushfire Hazard Level Assessment, Lush Fire & Planning, Nov 16

<sup>64</sup> Source: Cuballing / Popanyinning Local Planning Strategy Bushfire Hazard Level Assessment, Lush Fire & Planning, Nov 16



## Bushfire Prone Mapping

The intent of the WA Government's *Bushfire Prone Planning Policy* is to implement effective risk-based land use planning and development to preserve life and reduce the impact of bushfire on property and infrastructure.<sup>65</sup> The *State Planning Policy 3.7 – Planning for Bushfire Prone Areas* ensures bushfire risk is given due consideration in all future planning and development decisions. As the policy does not apply retrospectively and focuses on individual developments and buildings, the BRM Plan focuses on identifying existing bushfire risk and establishing an effective treatment plan to manage unacceptable community risks.

Broad-scale mapping of bushfire prone areas within the Shire of Cuballing indicates that large parts of the district are bushfire prone. This is reflected in *Figure 37*. Bushfire Prone Areas are subject to increased planning and construction requirements as detailed in the Planning and Development (Local Planning Scheme amendment) Regulations 2015.

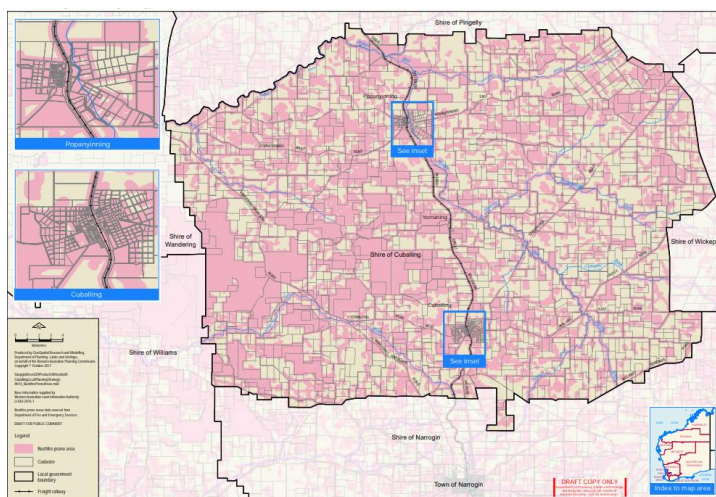


Figure 37: Map reflecting Bushfire Prone areas within the Shire of Cuballing as at Dec 2017<sup>66</sup>

## Harvest and Vehicle Movement Bans

In recognising the significance of agricultural activities in the Shire, and to reduce the risk of crop related bushfires; the Shire has controls in place pursuant to the *Bush Fires Regulations 1954*. These controls are reviewed annually by the Bushfire Advisory Committee (BFAC). One such control is the issuing of Harvest and Vehicle Movement Bans. The Shire can issue Harvest and Vehicle Movement Bans under *Bush Fires Regulations 1954 Section 38A, and/or Section 24C* to restrict the use of vehicles and machinery that have an increased risk of igniting a fire on days when weather conditions are considered unfavourable. Bans are generally issued because of the risk posed by agricultural practices during severe fire weather events.

Harvest and Vehicle Movement Bans are issued by the Shire's Chief Bush Fire Control Officer, in consultation with the Bushfire Brigade Fire Control Officers, when the use of engines, vehicles, plant or machinery during the Prohibited Burning Times or the Restricted Burning Times (or both) is likely to cause a fire or contribute to the spread of a bushfire. A Harvest and Vehicle Movement Ban may be imposed for any length of time but is generally imposed for the 'heat of the day' periods and may be extended or revoked by the local government, should weather conditions change.

<sup>65</sup> Source: *State Planning Policy 3.7 – Planning in Bushfire Prone Areas*

<sup>66</sup> Source: *Shire of Cuballing Local Planning Strategy, June 2019*

Whilst detailed records have not been kept for Harvest and Vehicle Movement Bans within the Shire, it is believed that on average, 5 bans are issued annually.<sup>67</sup>

## Response Capacity

Cuballing has six Volunteer Bush Fire Brigades with State Government Emergency Services Levy (ESL) funding the vehicles located in the Cuballing and Popanyinning townsites. Collectively, these brigades house one 4.4 appliance (4000lt water capacity), two 2.4 appliances (2 x 2000ltr water capacity) and one Light tanker.

The Volunteer Bush Fire Brigades registered within the Shire include:

- Cuballing East (Farmer response)
- Cuballing Town
- Cuballing West (Farmer response)
- Popanyinning East (Farmer response)
- Popanyinning Town
- Popanyinning West (Farmer response)

The Shire had 144 registered emergency services volunteers as at March 2020.

Initial fire suppression is supported by local farmer response units. Private appliances range from 500L slip on water units to various sized water carts.

The Shire has an active Bushfire Advisory Committee (BFAC) with the membership including those in leadership positions from each of the Brigades. BFAC members hold considerable bushfire firefighting skills and experience. This forum has been integral to the development of the BRM Plan and the BFAC membership will continue to be key stakeholders in the implementation and review of the plan.

In the context of the four stages of emergency management – *Prevention, Preparation, Response and Recovery*, the Shire of Cuballing has a strong and very proactive approach to bushfires. As bushfire events can directly impact a farmer's livelihood, colloquially '*if the smoke goes up*', history has shown a positive response reflecting the community's values and willingness to help their neighbours. There's an all hands on-deck approach with farmer response units arriving from neighbouring farms and further afield. The bushfire management and response skills and experience level is considered to be high amongst the volunteers with many of the volunteers amassing considerable years of service. The Shire and the community of Cuballing benefit greatly from the depth of skills, knowledge, experience and commitment from the emergency services volunteers.

The Emergency Services Volunteer figure of 144 does not reflect the additional personnel, sometimes referred to as 'spontaneous volunteers', who are not officially registered as Emergency Services (ES) Volunteers, but spring into action upon the first sight or smell of smoke. In line with the Shire's demographics, it is expected that most spontaneous volunteers would be farmers. Together with the registered farmer response personnel this has inherent benefits including:

- Access to mobile fire units
- Bushfire fighting skills
- Familiarity with the terrain, tracks, landmarks, landowners etc.

The local agricultural industry peaks in late October through to late December with the curing of crops and harvesting. The high reliance upon farmers for response may become an issue during the harvest season, when many local resources are engaged with agricultural activities however, whilst harvesting, farmers are required to have firefighting units at the ready allowing for a quick response. Conversely,

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<sup>67</sup> Source: Shire of Cuballing

there are more resources available for fire suppression and a greater sense of urgency to contain fire threatening unharvested paddocks.

Following harvest many farmers take their holidays which often involves leaving the Shire with their families. Consequently, this leads to fewer resources being available for observing and reporting bushfires, and possibly a reduced response and suppression capability during the critical summer months. There is however a drop in the risk in early February, post-harvest, as it is around this time that stock is rotated effectively reducing fuel loads through grazing. The risk rises again in March – May as some farmers undertake stubble burns in preparation for seeding and escapes from burn-offs are a known cause of fires in the area.

The key times within the Shire of Cuballing that may impact response are:

- Preparation for Seeding: March - May
- Seeding: April – June
- Hay/Harvest: September – January

Like most Local Governments the Shire of Cuballing has an annually issued Fire Break notice which details the requirements for residents to maintain and construct fire breaks, asset protection zones and undertake other fire mitigation activities. When firefighting resources are committed it's vital that the community have adequately prepared their properties and enacted their bushfire plans, as the demand for assistance will quickly exceed the capacity of available resources.

During the dry season (December to February) there is a general lack of water throughout the Shire. The Shire has purchased a 25 000 ltr Water Tanker to enable water to be carted to high risk areas in response to pending fire weather. They are also exploring the purchase of collar tanks for use in fire response, providing a further mobile water source able to be deployed throughout the Shire.

Concerns have also been raised in relation to accessibility of water within the Townsite of Popanyinning with only 2 hydrants and 1 standpipe available. Water pressure issues are evident and there are long turnaround times of over 20 minutes for refilling water tankers.

## 4. Asset Identification and Risk Assessment

### 4.1 Asset Identification

Asset identification and risk assessment has been conducted at the local level using the methodology described in the Guidelines'. Identified assets have been mapped, recorded and assessed in the Bushfire Risk Management System (BRMS). Identified assets are categorised into the following subcategories:

Table 6 – Asset Categories and Subcategories

Asset Category	Asset Subcategories
<b>Human Settlement</b>	<ul style="list-style-type: none"> <li>• <b>Residential areas</b> Rural urban interface areas and rural properties.</li> <li>• <b>Places of temporary occupation</b> Commercial, mining and industrial areas located away from towns and population centres (that is, not adjoining residential areas).</li> <li>• <b>Special risk and critical facilities</b> Hospitals, nursing homes, schools and childcare facilities, tourist accommodation and facilities, prison and detention centres, government administration centres and depots, incident control centres, designated evacuation centres, police, fire and emergency services.</li> </ul>
<b>Economic</b>	<ul style="list-style-type: none"> <li>• <b>Agricultural</b> Pasture, grazing, livestock, crops, viticulture, horticulture and other farming infrastructure.</li> <li>• <b>Commercial and industrial</b> Major industry, waste treatment plants, mines, mills and processing and manufacturing facilities and cottage industry.</li> <li>• <b>Critical infrastructure</b> Power lines and substations, water and gas pipelines, telecommunications infrastructure, railways, bridges, port facilities and waste water treatments plants.</li> <li>• <b>Tourist and recreational</b> Tourist attractions and recreational sites that generate significant tourism and/or employment within the local area.</li> <li>• <b>Commercial forests and plantations</b></li> <li>• <b>Drinking water catchments</b></li> </ul>
<b>Environmental</b>	<ul style="list-style-type: none"> <li>• <b>Protected</b> Rare and threatened flora and fauna, ecological communities and wetlands.</li> <li>• <b>Priority</b> Fire sensitive species and ecological communities.</li> <li>• <b>Locally important</b> Nature conservation and research sites, habitats, species and communities, areas of visual amenity.</li> </ul>
<b>Cultural</b>	<ul style="list-style-type: none"> <li>• <b>Aboriginal heritage</b> Places of indigenous significance.</li> <li>• <b>Recognised heritage</b> Assets afforded legislative protection through identification by the National Trust, State Heritage List or Local Planning Scheme Heritage List.</li> <li>• <b>Local heritage</b> Assets identified in a Municipal Heritage Inventory or by the community.</li> <li>• <b>Other</b> Other assets of cultural value, for example community centres and recreation facilities.</li> </ul>

## 4.2 Assessment of Bushfire Risk

Risk assessments have been undertaken for each asset, or group of assets, identified using the methodology described in the Guidelines. Most risk assessments were undertaken via ‘desk top’ assessment in the first instance. However, assets with a preliminary rating of ‘very high’ and ‘extreme’ have been validated through field assessment.

At the time of completing this Bushfire Risk Management Plan, a total of 320 assets have undergone a bushfire risk assessment.

The percentage of assets within the local government in each asset category at the time of BRM Plan endorsement is shown in Table 7:

Table 7 – Asset Category Proportions

Asset category	Proportion of identified assets
<b>Human Settlement</b>	<b>87.5%</b>
<b>Economic</b>	<b>7.5%</b>
<b>Environmental</b>	<b>0.35%</b>
<b>Cultural</b>	<b>4.65%</b>

### 4.2.1 Likelihood Assessment

Likelihood is described as the chance of a bushfire igniting, spreading and reaching an asset. The approach used to determine the likelihood rating is the same for each asset category: Human Settlement, Economic, Environmental and Cultural.

‘Likelihood’ has been assessed in the context of:

- **Separation Distance** – the distance between the asset and the hazard vegetation, and
- **Fuel Age** – the period elapsed since the fuel was last burnt

There are four possible likelihood ratings: almost certain, likely, possible, and unlikely.

Table 8– Likelihood Ratings

Likelihood Rating	Description
<b>Almost Certain</b> (Sure to Happen)	<ul style="list-style-type: none"> <li>• Is expected to occur in most circumstances;</li> <li>• High level of recorded incidents and/or strong anecdotal evidence; and/or</li> <li>• Strong likelihood the event will recur; and/or</li> <li>• Great opportunity, reason or means to occur;</li> <li>• May occur more than once in 5 years.</li> </ul>
<b>Likely</b> (Probable)	<ul style="list-style-type: none"> <li>• Regular recorded incidents and strong anecdotal evidence; and /or</li> <li>• Considerable opportunity, reason or means to occur;</li> <li>• May occur at least once in 5 years.</li> </ul>
<b>Possible</b> (feasible but < probable)	<ul style="list-style-type: none"> <li>• Should occur at some stage; and/or</li> <li>• Few, infrequent, random recorded incidents or little anecdotal evidence; and/or</li> <li>• Some opportunity, reason or means to occur.</li> </ul>
<b>Unlikely</b> (Improbable, not likely)	<ul style="list-style-type: none"> <li>• Would only occur under exceptional circumstances.</li> </ul>

## 4.2.2 Consequence Assessment

Consequence is described as the outcome or impact of a bushfire event. The approach used to determine the consequence rating is different for each asset category: Human Settlement, Economic, Environmental and Cultural.

**There are four possible consequence ratings: minor, moderate, major and catastrophic.**

**Table 9 – Consequence Ratings**

Consequence Rating	Descriptions
<b>Minor</b>	<ul style="list-style-type: none"> <li>• No fatalities.</li> <li>• Near misses or minor injuries with first aid treatment possibly required.</li> <li>• No persons are displaced.</li> <li>• Little or no personal support (physical, mental, emotional) required.</li> <li>• Inconsequential or no damage to an asset, with little or no specific recovery efforts required beyond the immediate clean-up.</li> <li>• Inconsequential or no disruption to community.</li> <li>• Inconsequential short-term failure of infrastructure or service delivery. (Repairs occur within 1 week, service outages last less than 24 hours.)</li> <li>• Inconsequential or no financial loss. Government sector losses managed within standard financial provisions. Inconsequential business disruptions.</li> </ul>
<b>Moderate</b>	<ul style="list-style-type: none"> <li>• Isolated cases of serious injuries, but no fatalities. Some hospitalisation required, managed within normal operating capacity of health services.</li> <li>• Isolated cases of displaced persons who return within 24 hours.</li> <li>• Personal support satisfied through local arrangements.</li> <li>• Localised damage to assets that is rectified by routine arrangements.</li> <li>• Community functioning as normal with some inconvenience.</li> <li>• Isolated cases of short to mid-term failure of infrastructure and disruption to service delivery. (Repairs occur within 1 week to 2 months, service outages last less than 1 week.)</li> <li>• Local economy impacted with additional financial support required to recover. Government sector losses require activation of reserves to cover loss. Disruptions to businesses lead to isolated cases of loss of employment or business failure.</li> <li>• Isolated cases of damage to environmental or cultural assets, one-off recovery efforts required, but with no long term effects to asset.</li> </ul>
<b>Major</b>	<ul style="list-style-type: none"> <li>• Isolated cases of fatalities.</li> <li>• Multiple cases of serious injuries. Significant hospitalisation required, leading to health services being overstretched.</li> <li>• Large number of persons displaced (more than 24 hours duration).</li> <li>• Significant resources required for personal support.</li> <li>• Significant damage to assets, with ongoing recovery efforts and external resources required.</li> <li>• Community only partially functioning. Widespread inconvenience, with some services unavailable.</li> <li>• Mid to long-term failure of significant infrastructure and service delivery affecting large parts of the community. Initial external support required. (Repairs occur within 2 to 6 months, service outages last less than a month.)</li> </ul>

Consequence Rating	Descriptions
	<ul style="list-style-type: none"> <li>Local or regional economy impacted for a significant period of time with significant financial assistance required. Significant disruptions across industry sectors leading to multiple business failures or loss of employment.</li> <li>Significant damage to environmental or cultural assets that require major rehabilitation or recovery efforts.</li> <li>Localised extinction of native species. This may range from loss of a single population to loss of all of the species within the BRM Plan area (for a species which occupies a greater range than just the BRM Plan area).</li> </ul>
<b>Catastrophic</b>	<ul style="list-style-type: none"> <li>Multiple cases of fatalities.</li> <li>Extensive number of severe injuries.</li> <li>Extended and large number requiring hospitalisation, leading to health services being unable to cope.</li> <li>Extensive displacement of persons for extended duration.</li> <li>Extensive resources required for personal support.</li> <li>Extensive damage to assets that will require significant ongoing recovery efforts and extensive external resources.</li> <li>Community unable to function without significant support.</li> <li>Long-term failure of significant infrastructure and service delivery affecting all parts of the community. Ongoing external support required. (Repairs will take longer than 6 months, service outages last more than 1 month.)</li> <li>Regional or State economy impacted for an extended period of time with significant financial assistance required. Significant disruptions across industry sectors leading to widespread business failures or loss of employment.</li> <li>Permanent damage to environmental or cultural assets.</li> <li>Extinction of a native species in nature. This category is most relevant to species that are restricted to the BRM Plan area, or also occur in adjoining areas and are likely to be impacted upon by the same fire event. 'In nature' means wild specimens and does not include flora or fauna bred or kept in captivity.</li> </ul>

The methodology used to determine the consequence rating for each asset category is based on the following:

- Consequence Rating - Human Settlement Assets**

The outcome or impact of a bushfire event on the asset, or a group of assets, measured by the hazard posed by the classified vegetation and the vulnerability of the asset.
- Consequence Rating - Economic Assets**

The outcome or impact of a bushfire event on the asset, or a group of assets, measured by the hazard posed by the classified vegetation and the vulnerability of the asset.
- Consequence Rating - Environmental Assets**

The outcome or impact of a bushfire event on the asset, or a group of assets, measured by the vulnerability of the asset and the potential impact of a bushfire or fire regime.
- Consequence Rating - Cultural Assets**

The outcome or impact of a bushfire event on the asset, or a group of assets, measured by the hazard posed by the classified vegetation and the vulnerability of the asset.

The methodology used to determine the consequence rating for each asset category is based on the following taken from the *Bushfire Risk Management Planning Handbook (2018)*:

### Determining Bushfire Hazard

The level of bushfire hazard for human settlement, economic and cultural assets is determined using a quantified bushfire hazard assessment model.<sup>68</sup> The model is based on the methodology set out in *AS3959-2009 Construction of buildings in bushfire prone areas* that is used to undertake a Bushfire Attack Level (BAL) assessment. The hazard assessment is used to measure the severity of an asset's potential exposure to ember attack, radiant heat and direct flame contact. Criteria applied when undertaking the bushfire hazard assessment is as follows:<sup>69</sup>

**Application of Fire Danger Index (FDI) 80.** - The fire danger index reflects the chance of a fire starting, its rate of spread, its intensity and the difficulty of its suppression, according to various combinations of air temperature, relative humidity, wind speed and both the long- and short-term drought effects. Inputs to hazard assessment calculation are reflective of FDI 80 (Grass Fire Danger Index 110) conditions, as per AS3959-2009. The higher the rating, the less chance of controlling a fire until weather conditions improve.

The Shire of Cuballing is located with the Upper Great Southern Fire Weather District. Given the prevalence of agricultural holdings within the Shire of Cuballing, the Grass Fire Danger Index is the model applied to determine the FDI within the Shire given the prevalence of agricultural activities.

From the FDI, predictions can be made regarding a fire's rate of spread, intensity and the potential for various suppression tactics to succeed. The FDI is the basis for determining the Fire Danger Rating, shown below, which is a scale developed to assist communities to better understand information about fire danger.<sup>70</sup>

- **Classification of vegetation** - Vegetation is classified as per the vegetation categories listed in the Guidelines, and in accordance with AS3959-2009. Vegetation meeting the low hazard exclusion criteria is automatically rated as low hazard. Where more than one vegetation type is present, the assessment is based on the vegetation type that presents the greatest hazard to the asset.
- **Separation Distance** - Is measured from the closest part of the assets, such as a house, to the nearest edge of the hazard vegetation. Where there is a flammable structure within 6 metres (e.g. a shed or patio next to a house), it is included as a part of the asset.
- **Slope** - Two slope measurements are used in the hazard assessment calculation – the slope of the land under the hazard vegetation and the slope of the land between the asset and the hazard vegetation.

Hazard assessments are based around Bushfire Management Zones (BMZ) with a focus on hazards within the Asset Protection Zone (20 metres) and Hazard Separation Zone (80 metres).

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<sup>68</sup> *Guidelines for Preparing a Bushfire Risk Management Plan (2015)*

<sup>69</sup> *AS3959-2009 Construction of buildings in bushfire prone areas*

<sup>70</sup> *Source: Department of Fire and Emergency Services*





Figure 38: Bushfire Management Zones <sup>71</sup>

The Fire Danger Ratings are explained below:







	<b>Catastrophic</b> FDI 100 +	<b>Catastrophic</b> What does it mean? These are the worst conditions for a bush or grass fire. Homes are not designed or constructed to withstand fires in these conditions. The safest place to be is away from high risk bushfire areas.
	<b>Extreme</b> FDI 75 - 99	<b>Extreme</b> What does it mean? Expect extremely hot, dry and windy conditions. If a fire starts and takes hold, it will be uncontrollable, unpredictable and fast moving. Spot fires will start, move quickly and come from many directions. Homes that are situated and constructed or modified to withstand a bushfire, that are well prepared and actively defended, may provide safety. You must be physically and mentally prepared to defend in these conditions.
	<b>Severe</b> FDI 50 - 74	<b>Severe</b> What does it mean? Expect hot, dry and possibly windy conditions. If a fire starts and takes hold, it may be uncontrollable. Well prepared homes that are actively defended can provide safety. You must be physically and mentally prepared to defend in these conditions.
	<b>Very High</b> FDI 32 - 49	<b>Very High</b> What does it mean? If a fire starts, it can most likely be controlled in these conditions and homes can provide safety. Be aware of how fires can start and minimise the risk. Controlled burning off may occur in these conditions if it is safe - check to see if permits apply.

Figure 39: Fire Danger Ratings <sup>72</sup>

### 4.2.3 Assessment of Environmental Assets

Using available biological information and fire history data, environmental assets with a known minimum fire threshold were assessed to determine if they were at risk from bushfire, within the five-year life of the BRM Plan. The Department of Biodiversity, Conservation and Attractions (DBCA) Parks and Wildlife Services (PWS) assisted with the identification and assessment of Environmental assets. Environmental assets that were unlikely to be adversely impacted by bushfire within the five-year

<sup>71</sup> Bushfire Risk Management Planning Handbook, DFES (March 2018)

<sup>72</sup> Source: Department of Fire and Emergency Services [www.dfes.wa.gov.au](http://www.dfes.wa.gov.au)

period have not been included and assessed in the BRM Plan. The negative impact of a fire on these assets (within the period of this BRM Plan) was determined to be minimal and may even be of benefit to the asset and surrounding habitat.

**4.2.4 Local Government Asset Risk Summary**

A risk profile for the Shire is provided in the summary (Table 10) below. This table shows the proportion of assets at risk from bushfire in each risk category at the time the BRM Plan was endorsed.

**Table 10 – Local Government Asset Risk Summary**

<b>Risk Rating</b> <b>Asset Category</b>	Low	Medium	High	Very High	Extreme
Human Settlement	0.35%	60%	20.65%	4.3%	2.2%
Economic	-	.95%	3.4%	1.9%	1.25%
Environmental	-	-	-	0.35%	-
Cultural	-	2.2%	1.5%	.95%	-

The ‘Guidelines for Preparing a Bushfire Risk Management Plan’ requires that only assets considered of value and vulnerable to bushfire are to be included in this plan consequently not all assets within the Shire have been included in the assessments.

An Asset Risk Register can be produced from the DFES managed Bushfire Risk Management System (BRMS). This details each asset, the risk assessment criteria applied and the resulting risk rating. Care should be maintained when releasing this data as the information is dynamic and should not be taken out of context or used for purposes other than those intended through this BRM Plan.

## 5. Risk Evaluation

### 5.1 Evaluating Bushfire risk

The risk rating for each asset has been assessed against the likelihood and consequence descriptions to ensure:

- The rating for each asset reflects the relative seriousness of the bushfire risk to the asset;
- Likelihood and consequence ratings assigned to each asset are appropriate; and
- Local issues have been considered.

### 5.2 Treatment Priorities

The treatment priority for each asset has been automatically assigned by BRMS, based on the asset's risk rating. **Table 11** shows how likelihood and consequence combine to give the risk rating and subsequent treatment priority for an asset.

Table 11 – Treatment Priorities

Consequence \ Likelihood	Minor	Moderate	Major	Catastrophic
Almost certain	3D (High)	2C (Very High)	1C (Extreme)	1A (Extreme)
Likely	4C (Medium)	3A (High)	2A (Very High)	1B (Extreme)
Possible	5A (Low)	4A (Medium)	3B (High)	2B (Very High)
Unlikely	5C (Low)	5B (Low)	4B (Medium)	3C (High)

### 5.3 Risk Acceptability

Risks below a certain level were not considered to require specific treatment during the life of this BRM Plan. They will be managed by routine local government wide controls and monitored for any significant change in risk.

In most circumstances risk acceptability and treatment will be determined by the land owner, in collaboration with local government and fire agencies. However, the following courses of action, as a general rule, have been adopted for each risk rating.

Table 12 – Criteria for Acceptance of Risk and Course of Action

Risk Rating	Criteria for Acceptance of Risk	Course of Action
Extreme (Priorities 1A, 1B, 1C)	<p>Requires asset specific treatment strategies to be applied.</p> <p>Treatment action is required within 2 years of the plan being endorsed.</p> <p>It is unlikely that Local Government Wide Controls would be adequate to manage the risk.</p>	<p>Specific action(s) required in the first 2 years of the BRM</p> <p>Assets to be included on the Shires annual fire break inspection</p> <p>Priorities will include</p> <ul style="list-style-type: none"> <li>• treatments that will have maximum benefit to multiple assets and critical infrastructure</li> <li>• Identification of partnerships with other agencies for strategic mitigation</li> </ul>

Risk Rating	Criteria for Acceptance of Risk	Course of Action
		<ul style="list-style-type: none"> <li>Assets within the townsite to be included on Fire Break inspection list</li> </ul> <p>Communication with stakeholders as per the Communications Plan</p>
<b>Very High</b> (Priorities 2A, 2B, 2C)	<p>Requires asset specific treatment strategies to be applied.</p> <p>Treatment action is required with 2 years of the plan being endorsed.</p> <p>It is unlikely that Local Government Wide Controls would be adequate to manage the risk.</p>	<p>Specific action(s) required in the first 3 years of the BRM Plan</p> <p>Assets to be included on the Shires annual fire break inspection</p> <p>Priorities will include</p> <ul style="list-style-type: none"> <li>treatments that will have maximum benefit to multiple assets and critical infrastructure</li> <li>Identification of partnerships with other agencies for strategic mitigation</li> </ul> <p>Assets within the townsite to be included on Fire Break inspection list</p> <p>Communication with stakeholders as per the Communications Plan</p>
<b>High</b> (Priorities 3A, 3B, 3C, 3D)	<p>Asset specific treatment strategies will likely be required to adequately manage the risk.</p>	<p>Specific action(s) required in the first 4 years of the BRM Plan</p> <p>Priorities will include</p> <ul style="list-style-type: none"> <li>Assets that fall adjacent to Extreme or Very High-risk assets</li> <li>treatments that will have maximum benefit to multiple assets and critical infrastructure</li> <li>Identification of partnerships with other agencies for strategic mitigation</li> </ul> <p>Communication with stakeholders as per the Communications Plan</p>
<b>Medium</b> (Priorities 4A, 4B, 4C)	<p>Asset specific treatments are not required, but risk should be monitored.</p> <p>Local government wide controls should be sufficient to manage the risk</p> <p>If there is a change in the landscape / environment these assets may need to be reassessed more frequently.</p>	<p>Addressed through Local Government Wide Controls</p> <p>Specific action is not required</p>

Risk Rating	Criteria for Acceptance of Risk	Course of Action
<p><b>Low</b> (Priorities 5A, 5B, 5C)</p>	<p>Asset specific treatments are not required, but risk should be monitored.</p> <p>Local government wide controls should be sufficient to manage the risk</p> <p>If there is a change in the landscape / environment these assets may need to be reassessed more frequently.</p>	<p>Addressed through Local Government Wide Controls and/or Community Education</p> <p>Specific action is not required</p>

## 6. Risk Treatment

The purpose of risk treatment is to reduce the likelihood of a bushfire occurring and/or the potential impact of a bushfire on the community, economy and environment. This is achieved by implementing treatments that modify the characteristics of the hazard, the community or the environment.

There are many strategies available to treat bushfire risk. The treatment strategy (or combination of treatment strategies) selected will depend on the level of risk and the type of asset being treated. Not all treatment strategies will be suitable in every circumstance.

### 6.1 Local Government-Wide Controls

Local government-wide controls reflect activities that reduce the overall bushfire risk within the Shire of Cuballing. These types of treatments are not linked to specific assets and are applied across all or part of the local government as part of normal business or due to legislative requirements. The following controls are currently in place across the Shire of Cuballing:

- i. *Bush Fires Act 1954* Section 33 notices, including applicable fuel management requirements, firebreak standards and annual enforcement programs;
- ii. Declaration and management of Prohibited Burn Times, Restricted Burn Times and Harvest and Vehicle Movement Bans for the local government;
- iii. Public education campaigns, including Shire community education programs, and the use of DBCA and DFES state-wide programs, tailored to suit local needs; including programs such as *5-Minute Fire Chat, Bushfire Action Month, Are You Ready Campaign* etc;
- iv. State-wide arson prevention programs developed in conjunction with WA Police and DFES;
- v. State planning framework and local planning schemes, implementation of appropriate land subdivision and building standards in line with DFES, Department of Planning and Building Commission policies and standards;
- vi. Monitoring performance against the BRM Plan and reporting annually to the Shire of Cuballing and OBRM;
- vii. Shire of Cuballing's annual works program; and
- viii. Other practices and programs undertaken by local government or state agencies (**Multi-Agency Work Plans**) that contribute to bushfire risk management within the local government, including controls in place under state government policies, agreements or memorandums of understanding. These include:
  - a. Department of Fire and Emergency Services program of works on Unallocated Crown Land and Unmanaged Reserves;
  - b. Department of Biodiversity, Conservation and Attractions Master Burn Program;
  - c. Water Corporation Bushfire Risk Management Plan;
  - d. Western Power annual asset inspection and vegetation management program;
  - e. Department of Education Memorandum of Understanding;
  - f. Main Roads WA Bridge Assessment and Maintenance Works Plan;
  - g. Shire of Cuballing's pre-season meetings and training with Fire Control Officers and local Brigade members covering high risk areas; and
  - h. Total Fire Bans.

A **Local Government-Wide Controls and Multi-Agency Work Plan** is attached at **Appendix 2**. The plan details work to be undertaken as a part of normal business, to improve current controls or to implement new controls to better manage bushfire risk across the local government.

### 6.2 Asset-Specific Treatment Strategies

Asset-specific treatments are implemented to protect an individual asset or group of assets, identified and assessed in the BRM Plan as being at risk from bushfire. There are six asset specific treatment strategies:

- **Fuel management** - Treatment reduces or modifies the bushfire fuel through manual, chemical and prescribed burning methods;

- **Ignition management** - Treatment aims to reduce potential human and infrastructure sources of ignition in the landscape;
- **Preparedness** - Treatments aim to improve access and water supply arrangements to assist firefighting operations;
- **Planning** - Treatments focus on developing plans to improve the ability of firefighters and the community to respond to bushfire; and
- **Community Engagement** - Treatments seek to build relationships, raise awareness and change the behaviour of people exposed to bushfire risk.
- **Other** - Local government-wide controls, such as community education campaigns and planning policies, will be used to manage the risk. Asset-specific treatment is not required or not possible in these circumstances.

### 6.3 Determining the Treatment Schedule

The Treatment Schedule will be developed in broad consultation with land owners and other stakeholders and efforts will be made to finalise the Treatment Schedule within six months of this BRM Plan being endorsed by council. It is expected that the Treatment Schedule will be a dynamic document and will be amended to account for changing circumstances, including changes to assets and/or risk ratings.

Land owners are ultimately responsible for treatments implemented on their own land. This includes any costs associated with the treatment and obtaining the relevant approvals, permits or licences to undertake an activity. Where agreed, another agency may manage a treatment on behalf of a land owner. However, the onus is still on the land owner to ensure treatments detailed in this BRM Plan are completed.

It is important to note that some treatments, particularly those aimed at reducing the vegetation profile, will require ongoing management and will likely need to be repeated periodically in order to sustain risk reduction gains post the initial treatment. The maintenance regime should be included in the treatment schedule where possible.

## 7. Monitoring and Review

Monitoring and review processes are in place to ensure that the BRM Plan remains current and valid. These processes are detailed below to ensure outcomes are achieved in accordance with the *Communication Strategy* and *Treatment Schedule*.

### 7.1 Review

A comprehensive review of this BRM Plan will be undertaken at least once every five years, from the date of council endorsement. Significant circumstances that may warrant an earlier review of the BRM Plan include:

- Changes to the BRM Plan area, organisational responsibilities or legislation;
- Changes to the bushfire risk profile of the area; or
- Following a major fire event.

### 7.2 Monitoring

BRMS will be used to monitor the risk ratings for each asset identified in the BRM Plan and record the treatments implemented. New assets will be added to the *Asset Risk Register* when they are identified.

The Shire of Cuballing has determined that assets rated:

- 'Extreme' risk will be reassessed biennially and at the completion of a treatment as part of the post treatment evaluation
- 'Very High' risk will be reassessed biennially where possible and at the completion of a treatment as part of the post treatment evaluation
- 'High' risk will be reassessed at least once during the life of the plan or at the completion of a treatment as part of the post treatment evaluation
- 'Low' and 'Medium' risk should be reassessed during the development of future plans.

The plan will be monitored by a member of the Shire Administration Team designated by the Chief Executive Officer.

Post-treatment Risk Assessment, using the Bushfire Risk Management System, involves completing a risk re-assessment at the completion of any scheduled treatment/s to confirm that the treatment objectives have been achieved. This could include evaluation of the initial treatment or ongoing treatments included in a treatment management plan, noting that treatments may need to be repeated periodically to sustain risk reduction gains. The post-treatment risk assessment may identify that further treatments are required to reduce an asset's risk rating to an acceptable level. The post-treatment assessment uses the same methodology as the original assessment. All inputs to the assessment should be reviewed and updated to reflect any change (e.g. changes to the asset or surrounding area).

Risk Re-assessment involves an additional assessment to determine if any factors have changed (e.g. increases in fuel age, developments) that may impact upon the asset's risk rating. Risk re-assessments may be undertaken at any time using a 'desk top' assessment to review data and spatial information in BRMS. Ideally risk re-assessment for 'extreme' and 'very high' risk assets would include a site visit.

### 7.3 Reporting

The Shire of Cuballing will submit an annual report to the Office of Bushfire Risk Management summarising progress made towards implementation of the BRM Plan. This report will also be submitted to the Council for endorsement.

The reporting requirements will be managed by a member of the Shire Administration Team designated by the Chief Executive Officer.



### 7.3.1 Privacy Issues and Release of Information

Information captured through the Bushfire Risk Management System (BRMS) includes data considered 'personal' in nature including the names and addresses of landholders. There is therefore the potential for the data collected through the BRMS to be used for purposes other than bushfire risk mitigation (i.e. Insurance companies using this information to set insurance premiums).

The Chief Executive Officer is to be consulted prior to any Bushfire Risk Management Planning data being released to the public domain.

To actively encourage and support the implementation, monitoring and review of agreed actions the Shire of Cuballing, as a matter of course or upon request, will provide reports to key stakeholders that detail the assets and treatments that the stakeholders (landowners) have responsibility for.

## 8. Glossary

<b>Asset</b>	A term used to describe anything of value that may be adversely impacted by bushfire. This may include residential houses, infrastructure, commercial, agriculture, industry, environmental, cultural and heritage sites.
<b>Asset Category</b>	There are four categories that classify the type of asset – Human Settlement, Economic, Environmental and Cultural.
<b>Asset Owner</b>	The owner, occupier or custodian of the asset itself. Note: this may differ from the owner of the land the asset is located on, for example a communication tower located on leased land or private property.
<b>Asset Register</b>	A component within the Bushfire Risk Management System used to record the details of assets identified in the Bushfire Risk Management Plan.
<b>Asset Risk Register</b>	A report produced within the Bushfire Risk Management System that details the consequence, likelihood, risk rating and treatment priority for each asset identified in the Bushfire Risk Management Plan.
<b>Bushfire</b>	Unplanned vegetation fire. A generic term which includes grass fires, forest fires and scrub fires both with and without a suppression objective. <sup>73</sup>
<b>Bushfire Hazard</b>	The hazard posed by the classified vegetation, based on the vegetation category, slope and separation distance.
<b>Bushfire Management Plan</b>	A document that sets out short, medium and long term bushfire risk management strategies for the life of a development. <sup>74</sup>
<b>Bushfire risk management</b>	A systematic process to coordinate, direct and control activities relating to bushfire risk with the aim of limiting the adverse effects of bushfire on the community.
<b>Consequence</b>	The outcome or impact of a bushfire event.
<b>Draft Bushfire Risk Management Plan</b>	The finalised draft Bushfire Risk Management Plan (BRM Plan) is submitted to the OBRM for review. Once the OBRM review is complete, the BRM Plan is called the 'Final BRM Plan' and can be progressed to local government council for endorsement.
<b>Emergency Risk Management Plan</b>	A document (developed under <i>State Emergency Management Policy 2.9</i> ) that describes how an organisation(s) intends to undertake the activities of emergency risk management based on minimising risk. These plans help inform the ongoing development of Local Emergency Management Arrangements (LEMA) and Westplans.

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<sup>73</sup> Australasian Fire and Emergency Service Authorities Council 2012, *AFAC Bushfire Glossary*, AFAC Limited, East Melbourne.

<sup>74</sup> Western Australian Planning Commission 2015, *State Planning Policy 3.7: Planning in Bushfire Prone Areas*, WAPC, Perth.

<b>Geographic Information System (GIS)</b>	A data base technology, linking any aspect of land-related information to its precise geographic location. <sup>75</sup>
<b>Geographic Information System (GIS) Map</b>	The mapping component of the Bushfire Risk Management System. Assets, treatments and other associated information is spatially identified, displayed and recorded within the GIS Map.
<b>Land Owner</b>	The owner of the land, as listed on the Certificate of Title; or leaser under a registered lease agreement; or other entity that has a vested responsibility to manage the land.
<b>Likelihood</b>	The chance of something occurring. In this instance, the chance of a bushfire igniting, spreading and reaching the asset.
<b>Locality</b>	The officially recognised boundaries of suburbs (in cities and larger towns) and localities (outside cities and larger towns).
<b>Priority</b>	See Treatment Priority.
<b>Recovery Cost</b>	The capacity of an asset to recover from the impacts of a bushfire.
<b>Responsible Person</b>	The person responsible for planning, coordinating, implementing, evaluating and reporting on a risk treatment.
<b>Risk acceptance</b>	The informed decision to accept a risk, based on the knowledge gained during the risk assessment process.
<b>Risk analysis</b>	The application of consequence and likelihood to an event in order to determine the level of risk.
<b>Risk assessment</b>	The systematic process of identifying, analysing and evaluating risk.
<b>Risk evaluation</b>	The process of comparing the outcomes of risk analysis to the risk criteria to determine whether a risk is acceptable or tolerable.
<b>Risk identification</b>	The process of recognising, identifying and describing risks.
<b>Risk Manager</b>	The organisation or individual responsible for managing a risk identified in the Bushfire Risk Management Plan; including review, monitoring and reporting.
<b>Risk Register</b>	A component within the Bushfire Risk Management System used to record, review and monitor risk assessments and treatments associated with assets recorded in the Bushfire Risk Management Plan.
<b>Risk treatment</b>	A process to select and implement appropriate measures undertaken to modify risk.

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<sup>75</sup> Landgate 2015, *Glossary of terms*, Landgate, Perth

<b>Rural</b>	Any area where in residences and other developments are scattered and intermingled with forest, range, or farm land and native vegetation or cultivated crops. <sup>76</sup>
<b>Rural Urban Interface (RUI)</b>	The line or area where structures and other human development adjoin or overlap with undeveloped bushland. <sup>77</sup>
<b>Slope</b>	The angle of the ground’s surface measured from the horizontal.
<b>Tenure Blind</b>	An approach where multiple land parcels are considered as a whole, regardless of individual ownership or management arrangements.
<b>Treatment</b>	An activity undertaken to modify risk, for example a prescribed burn.
<b>Treatment Objective</b>	The specific aim to be achieved or action to be undertaken, to complete the treatment. Treatment objectives should be specific and measurable.
<b>Treatment Manager</b>	The organisation, or individual, responsible for all aspects of a treatment listed in the Treatment Schedule of the Bushfire Risk Management Plan, including coordinating or undertaking work, monitoring, reviewing and reporting.
<b>Treatment Priority</b>	The order, importance or urgency for allocation of funding, resources and opportunity to treatments associated with a particular asset. The treatment priority is based on an asset’s risk rating.
<b>Treatment Schedule</b>	A report produced within the Bushfire Risk Management System that details the treatment priority of each asset identified in the Bushfire Risk Management Plan and the treatments scheduled.
<b>Treatment Strategy</b>	The broad approach that will be used to modify risk, for example fuel management.
<b>Treatment Type</b>	The specific treatment activity that will be implemented to modify risk, for example a prescribed burn.
<b>Vulnerability</b>	The susceptibility of an asset to the impacts of bushfire.

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<sup>76</sup> Australasian Fire and Emergency Service Authorities Council 2012, *AFAC Bushfire Glossary*, AFAC Limited, East Melbourne

<sup>77</sup> Australasian Fire and Emergency Service Authorities Council 2012, *AFAC Bushfire Glossary*, AFAC Limited, East Melbourne

## 9. Common Abbreviations

APZ	Asset Protection Zone
BRMP	Bushfire Risk Management Planning
BRMS	Bushfire Risk Management System
CALD	Culturally and Linguistically Diverse
DEMC	District Emergency Management Committee
DFES	Department of Fire and Emergency Services
ERMP	Emergency Risk Management Plan
FFDI	Forest Fire Danger Index
FMP	Fire Management Plan
GFDI	Grassland Fire Danger Index
GIS	Geographic Information System
HSZ	Hazard Separation Zone
JAFFA	Juvenile and Family Fire Awareness
LEMA	Local Emergency Management Arrangements
LEMC	Local Emergency Management Committee
LG	Local Government
LMZ	Land Management Zone
OBRM	Office of Bushfire Risk Management
PWS	Department of Biodiversity, Conservation and Attractions - Parks and Wildlife Service
SEMC	State Emergency Management Committee
SLIP	Shared Land Information Platform
WAPC	Western Australian Planning Commission



*Shire of Cuballing*

**Bushfire Risk Management Planning  
Communication Strategy**

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### *Document Control*

<b>Document Name</b>	<b>Communications Strategy</b>	<b>Current Version</b>	<b>1.1</b>
<b>Document Owner</b>	Shire of Cuballing CEO	<b>Issue Date</b>	May 2020
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### *Related Documents*

<b>Title</b>	<b>Version</b>	<b>Date</b>
Shire of Cuballing Bushfire Risk Management Plan	1.1	

### *Amendment List*

<b>Version</b>
<b>1.0</b>

# 1 INTRODUCTION

A Bushfire Risk Management Plan (BRM Plan) is a strategic document that outlines the approach to the identification, assessment and treatment of assets exposed to bushfire risk within the Shire of Cuballing. This Communication Strategy accompanies the BRM Plan for the Shire of Cuballing. It documents the communication objectives for the BRM Plan, roles and responsibilities for communication, key stakeholders, target audiences and key messages at each project stage, communication risks and strategies for their management, and communication monitoring and evaluation procedures.

## 2 COMMUNICATIONS OVERVIEW

### Communication Objectives

The communication objectives for the development, implementation and review of the BRM Plan for the Shire of Cuballing are as follows:

1. Key stakeholders understand the purpose of the BRM Plan and their role in the bushfire risk management planning process.
2. Stakeholders who are essential to the bushfire risk management planning process, or can supply required information, are identified and engaged in a timely and effective manner.
3. Relevant stakeholders are involved in decisions regarding risk acceptability and treatment.
4. Key stakeholders engage in the review of the BRM Plan as per the schedule in place for the local government area.
5. The community and other stakeholders engage with the bushfire risk management planning process and as a result are better informed about bushfire risk and understand their responsibilities to address bushfire risk on their own land.

### Communication Roles and Responsibilities

The Shire of Cuballing is responsible for the development, implementation and review of the Communication Strategy. Key stakeholders support local government by participating in the development and implementation of the Communications Strategy as appropriate. An overview of communication roles and responsibilities follows:

- Shire of Cuballing CEO, or nominee, is responsible for:
  - endorsement of the BRM Plan Communications Strategy,
  - external communication with the local government area,
  - operational-level communication between the Shire and the Department of Fire and Emergency Services
  - approve the release of BRMS and BRM Plan data.
  - BRM Plan monitoring, review and reporting



## Key Stakeholders for Communication

The following table identifies key stakeholders in bushfire risk management planning. These are stakeholders that are identified as having a significant role or interest in the planning process or are likely to be significantly impacted by the outcomes.

Stakeholder	Role or interest	Level of impact on outcomes	Level of engagement
<b>Shire of Cuballing</b>	Significant role in plan and treatment development, implementation and review. Responsible for treatments as a land owner/manager.	High	Inform, consult, involve, collaborate and empower
<b>Department of Fire and Emergency Services</b>	Significant role in plan and treatment development, implementation and review. Support role in treatment Implementation.	High	Inform, consult, involve and collaborate
<b>Department of Biodiversity, Conservation and Attractions</b>	Significant role in plan and treatment development, implementation and review. Responsible for treatments as a land owner/manager.	High	Inform, consult, involve, collaborate and empower
<b>Main Roads WA</b>	Role in plan and treatment development, implementation and review. Responsible for treatments as a land owner/manager. Critical infrastructure interest.	Medium	Inform, consult, involve, collaborate
<b>Telecommunication providers</b>	Role in plan and treatment development, implementation and review. Responsible for treatments as a land owner/manager. Critical infrastructure interest.	Medium	Inform, consult, involve, collaborate
<b>Department of Planning, Lands and Heritage, LandCorp &amp; Landgate</b>	Role in plan and treatment development, implementation and review	Medium	Inform, consult, involve, collaborate
<b>Water Corporation &amp; Department of Water</b>	Role in plan and treatment development, implementation and review. Responsible for treatments as a land owner/manager. Critical infrastructure interest.	Medium	Inform, consult, involve, collaborate
<b>Private Land Owners</b>	Role in plan and treatment development, implementation and review. May have responsibilities for treatments as land owners/managers	High	Inform, consult, involve, collaborate and empower
<b>Western Power</b>	Role in plan and treatment development, implementation and review. Responsible for treatments as a land owner/manager. Critical infrastructure interest.	Medium	Inform, consult, involve, collaborate
<b>Chief Bushfire Control Officer</b>	Significant role in plan and treatment development, implementation and review. Actively assist in risk identification and treatment works. Empower to actively engage with community and identify/treat risks	High	Inform, consult, involve, collaborate and empower
<b>Bushfire Brigades and other Emergency Services Volunteers</b>	Significant role in plan and treatment development, implementation and review. Assist in risk identification and treatment works.	High	Inform, consult, involve, collaborate
<b>Shire of Cuballing Bushfire Advisory Committee</b>	Role in plan development, implementation and review. Actively assist in risk identification and treatment works. Empower to actively engage with community and identify/treat risks	High	Inform, consult, involve, collaborate

<b>Regional Operations Advisory Committee</b>	Role in plan development, implementation and review	Medium	Inform, consult, involve, collaborate
<b>Local Emergency Management Committee</b>	Role in plan development, implementation and review	Medium	Inform, consult, involve
<b>Traditional Owners, Gnaala Karla Boodja Regional Corporation, South West Aboriginal Land and Sea Council &amp; Department of Aboriginal Affairs</b>	Role in plan and treatment development, implementation and review. May have responsibilities for treatments as land owners/managers	Medium	Inform, consult and involve
<b>Shire of Cuballing Communities</b>	Role in plan implementation and review	Medium	Inform, involve and consult

## Communications Plan

Timing of Communication	Stakeholder (s)	Communication Objectives (Refer to Page 64)	Communication Method	Key Message or Purpose	Responsibility	Identified Risks to Communication	Strategy to Manage Risks	Monitoring & Evaluation Method
<b>Development of the BRM Plan and Treatment Schedule</b>								
<b>Annually or as required</b>	Shire of Cuballing CEO, Senior Leadership Team and Council	1 – 3 & 5	<ul style="list-style-type: none"> <li>Email</li> <li>Face to face meetings</li> </ul>	<ul style="list-style-type: none"> <li>Inform and consult</li> <li>Confirm accountability and responsibilities</li> <li>Input into plan and treatments</li> </ul>	BRMO & BRPC	<ul style="list-style-type: none"> <li>Resource constraints could limit their ability to participate</li> </ul>	<ul style="list-style-type: none"> <li>Clarify misunderstandings and intentions of plan</li> <li>Express value of meeting</li> </ul>	<ul style="list-style-type: none"> <li>Stakeholder's willingness to participate</li> <li>Feedback on the presentation</li> </ul>
<b>Annually or as required</b>	Shire of Cuballing Senior Leadership Team	1 – 3 & 5	<ul style="list-style-type: none"> <li>Email</li> <li>Face to face meetings</li> <li>Phone</li> </ul>	<ul style="list-style-type: none"> <li>Input into plan and treatments</li> </ul>	CEO or Delegate	<ul style="list-style-type: none"> <li>Limited time</li> <li>Conflicting priorities</li> </ul>	<ul style="list-style-type: none"> <li>Plan meetings</li> </ul>	<ul style="list-style-type: none"> <li>Stakeholder's willingness to participate</li> <li>Contributions to treatment plan</li> </ul>
<b>Bi-Annually</b>	Bushfire Advisory Committee (BFAC) and Regional Operations Advisory Committee (ROAC)	1 – 3 & 5	<ul style="list-style-type: none"> <li>Email</li> <li>Face to face meeting</li> <li>Presentation</li> </ul>	<ul style="list-style-type: none"> <li>Inform and consult</li> <li>Confirm project objectives</li> <li>Seek input into treatment plans</li> <li>Project updates</li> </ul>	BRMO & BRPC	<ul style="list-style-type: none"> <li>Stakeholder's willingness to participate</li> <li>Availability of volunteers</li> </ul>	<ul style="list-style-type: none"> <li>Preparation</li> <li>Ensure current information on the BRM Plan Project is available</li> </ul>	<ul style="list-style-type: none"> <li>Seek feedback on the presentation and (anecdotal) community feedback</li> </ul>
<b>Annually and as required</b>	Local Emergency Management Committee (LEMC)	1 – 3 & 5	<ul style="list-style-type: none"> <li>Email</li> <li>Face to face meetings</li> <li>Presentation</li> </ul>	<ul style="list-style-type: none"> <li>Confirm project objectives</li> <li>Seek input into treatment plans</li> <li>Project updates</li> </ul>	BRMO & BRPC	<ul style="list-style-type: none"> <li>Stakeholder's willingness to participate</li> </ul>	<ul style="list-style-type: none"> <li>Preparation</li> <li>Ensure current information on the BRM Plan Project is available</li> </ul>	<ul style="list-style-type: none"> <li>Feedback on the presentation</li> </ul>
<b>Quarterly or as required</b>	Chief Bushfire Control Officer (CBFCO), Bushfire Brigades, Brigade Captains	1 – 3 & 5	<ul style="list-style-type: none"> <li>Email</li> <li>Face to face meetings</li> </ul>	<ul style="list-style-type: none"> <li>Confirm project objectives</li> <li>Seek input into treatment plans and providing project updates</li> </ul>	BRMO & BRPC	<ul style="list-style-type: none"> <li>Time constraints</li> <li>No plan, unorganised</li> <li>Availability of volunteers</li> </ul>	<ul style="list-style-type: none"> <li>Clarify misunderstandings and intentions of plan</li> <li>Confirm benefits</li> <li>Preparation</li> </ul>	<ul style="list-style-type: none"> <li>Feedback</li> <li>Support for BRMP process</li> <li>Level of engagement</li> </ul>

				<ul style="list-style-type: none"> <li>Identify Risk and share information</li> </ul>			<ul style="list-style-type: none"> <li>Ensure current information on the BRM Plan Project is available</li> </ul>	
<b>Biannually</b>	Dept of Biodiversity, Conservation and Attractions	1 – 3 & 5	<ul style="list-style-type: none"> <li>Face to face meetings</li> <li>Email</li> <li>Telephone</li> </ul>	<ul style="list-style-type: none"> <li>Confirmation of environmental assets</li> <li>Identification of DBCA burn plans</li> <li>Confirming project objectives, seeking input into treatment plans and providing project updates</li> <li>Development of treatment options</li> </ul>	BRMO & BRPO	<ul style="list-style-type: none"> <li>Resource constraints could limit their ability to participate</li> <li>Willingness to release 'confidential' data re environmental assets</li> </ul>	<ul style="list-style-type: none"> <li>Clarify misunderstandings and intentions of plan</li> <li>Provide undertakings re the release of confidential data</li> <li>Restrict release of information and document in plan</li> </ul>	<ul style="list-style-type: none"> <li>Level of engagement</li> <li>Environmental assets in BRMS</li> </ul>
<b>Annually and as required</b>	Stakeholders – Landowners / Land Managers	1 – 3 & 5	<ul style="list-style-type: none"> <li>Email</li> <li>Face to face meeting</li> <li>Telephone</li> <li>Presentations</li> <li>Community Engagement activities</li> </ul>	<ul style="list-style-type: none"> <li>Asset identification/ confirmation</li> <li>Outline BRMP process and objectives</li> <li>Identify assets at risk</li> <li>Identify existing controls/programs</li> <li>Development of treatment options</li> </ul>	BRMO & BRPO	<ul style="list-style-type: none"> <li>Time constraints and travel</li> <li>Level of interest and engagements in process</li> <li>Lack of resourcing</li> </ul>	<ul style="list-style-type: none"> <li>Select appropriate channel of communication</li> <li>Prepare materials and good planning</li> <li>Communicate funding opportunities when available</li> </ul>	<ul style="list-style-type: none"> <li>Engagement and participation levels</li> <li>Feedback</li> <li>Contributions to treatment strategies</li> </ul>
<b>Annually or as required</b>	Stakeholders – Others	1 – 3 & 5	<ul style="list-style-type: none"> <li>Email</li> <li>Face to face meeting</li> <li>Telephone</li> <li>Presentations</li> <li>Community Engagement activities</li> </ul>	<ul style="list-style-type: none"> <li>Asset identification/ confirmation</li> <li>Inform of BRMP process</li> <li>Identify assets at risk</li> <li>Identify existing controls/programs</li> <li>Development of treatment options</li> </ul>	BRMO & BRPC	<ul style="list-style-type: none"> <li>Time constraints and travel</li> <li>Level of interest and engagements in process</li> </ul>	<ul style="list-style-type: none"> <li>Select appropriate channel of communication</li> <li>Prepare materials</li> <li>Plan communication</li> </ul>	<ul style="list-style-type: none"> <li>Engagement and participation levels</li> <li>Feedback</li> </ul>
<b>Annually and as required</b>	Office of Bushfire Risk Management	1 & 2	<ul style="list-style-type: none"> <li>Email</li> <li>Face to face meetings</li> </ul>	<ul style="list-style-type: none"> <li>Compliance and governance</li> <li>Plan endorsement</li> </ul>	CEO or Delegate	<ul style="list-style-type: none"> <li>Government funding</li> <li>Government priorities</li> </ul>	<ul style="list-style-type: none"> <li>Stay up to date with process improvements</li> </ul>	<ul style="list-style-type: none"> <li>Plan endorsed</li> </ul>

						<ul style="list-style-type: none"> <li>Identified non compliances</li> </ul>		
<b>Bi-annually and as required</b>	Dept of Fire and Emergency Services (DFES) – District/Regional Office	1 – 3 & 5	<ul style="list-style-type: none"> <li>Email</li> <li>Face to face meetings</li> <li>Telephone</li> </ul>	<ul style="list-style-type: none"> <li>UCL/UMR planned works</li> <li>Identification of treatment strategies</li> <li>Identification of other planned works</li> <li>Sharing information</li> <li>Identifying funding opportunities</li> </ul>	BRMO & BRPC	<ul style="list-style-type: none"> <li>Time constraints</li> <li>Conflicting priorities</li> <li>Response obligations</li> </ul>	<ul style="list-style-type: none"> <li>Plan communications</li> <li>Share information</li> </ul>	<ul style="list-style-type: none"> <li>Other planned works identified</li> <li>Funding opportunities identified</li> <li>UCL/UMR treatments included on BRMS</li> </ul>
<b>Implementation of the BRM Plan and Treatment Schedule</b>								
<b>Timing of Communication</b>	<b>Stakeholder (s)</b>	<b>Communication Objectives</b> <i>(Refer to Page 64)</i>	<b>Communication Method</b>	<b>Key Message or Purpose</b>	<b>Responsibility</b>	<b>Identified Risks to Communication</b>	<b>Strategy to Manage Risks</b>	<b>Monitoring &amp; Evaluation Method</b>
<b>Life of Plan</b>	Shire of Cuballing CEO, Senior Leadership Team and Council	All (1 – 5)	<ul style="list-style-type: none"> <li>Email</li> <li>Face to face meetings</li> </ul>	<ul style="list-style-type: none"> <li>Inform and consult</li> <li>Confirm accountabilities and responsibilities.</li> <li>Progress update</li> <li>Issues identification and action planning</li> </ul>	CEO or Delegate	<ul style="list-style-type: none"> <li>Time constraints</li> <li>Availability</li> <li>Lack of understanding</li> <li>Budget (for LG mitigation)</li> </ul>	<ul style="list-style-type: none"> <li>Planning and time management</li> <li>Clear purpose</li> <li>Targeted communication</li> <li>Regular updates</li> </ul>	<ul style="list-style-type: none"> <li>Feedback,</li> <li>Questions raised</li> <li>Level of support received</li> </ul>
<b>Life of Plan</b>	Shire of Cuballing Building and Works	1 -3 & 5	<ul style="list-style-type: none"> <li>Email</li> <li>Face to face meetings</li> </ul>	<ul style="list-style-type: none"> <li>Reduction of fuel loads on LG managed lands</li> <li>Upgrades to strategic firebreaks</li> </ul>	CEO or Delegate	<ul style="list-style-type: none"> <li>Poor organisation,</li> <li>Limited time,</li> <li>Not preparing</li> <li>Poor communication from stakeholders and LG on completion of works</li> </ul>	<ul style="list-style-type: none"> <li>Clarify misunderstandings and intentions of plan</li> <li>Plan communications</li> <li>Regular updates</li> </ul>	<ul style="list-style-type: none"> <li>Treatments applied</li> <li>Positive feedback received on treatment supplied</li> <li>Risk ratings reduced</li> </ul>
<b>Biannually or as required</b>	LEMC, BFAC, ROAC, CBFCO, CAPTS	<b>All (1 – 5)</b>	<ul style="list-style-type: none"> <li>Email</li> <li>Face to face meetings</li> </ul>	<ul style="list-style-type: none"> <li>Report on progress to plan</li> <li>Report issues/constraints</li> </ul>	CEO or Delegate	<ul style="list-style-type: none"> <li>Availability of volunteers</li> <li>Time</li> <li>'Buy in'</li> </ul>	<ul style="list-style-type: none"> <li>Collate data and report on success to plan</li> </ul>	<ul style="list-style-type: none"> <li>Feedback received</li> <li>Level of engagement</li> </ul>

						<ul style="list-style-type: none"> <li>• Lack of understanding</li> </ul>	<ul style="list-style-type: none"> <li>• Compliance to plan</li> <li>• Keep informed</li> </ul>	<ul style="list-style-type: none"> <li>• Issues identified and addressed</li> </ul>
All (1 – 5)	Dept of Biodiversity, Conservation and Attractions	1 – 3 & 5	<ul style="list-style-type: none"> <li>• Face to face meetings</li> <li>• Email</li> <li>• Telephone</li> </ul>	<ul style="list-style-type: none"> <li>• Confirmation of environmental assets</li> <li>• Development of treatment options</li> </ul>	CEO or Delegate	<ul style="list-style-type: none"> <li>• Resource constraints could limit their ability to participate</li> <li>• Willingness to release 'confidential' data re environmental assets</li> </ul>	<ul style="list-style-type: none"> <li>• Clarify misunderstandings and intentions of plan</li> <li>• Provide undertakings re the release of confidential data</li> <li>• Restrict release of information and document in plan</li> </ul>	<ul style="list-style-type: none"> <li>• Level of engagement</li> <li>• Environmental assets in BRMS</li> </ul>
<b>As per Section 7.2 of this plan</b>	Stakeholders – Landowners / Land Managers	1 – 3 & 5	<ul style="list-style-type: none"> <li>• Email</li> <li>• Face to face meetings</li> <li>• Presentations</li> <li>• Community Engagement</li> </ul>	<ul style="list-style-type: none"> <li>• Inform and consult</li> <li>• Confirm accountability and responsibility</li> <li>• Status and progress of plan</li> <li>• Treatment status, gaps and issues to be addressed</li> </ul>	CEO or Delegate	<ul style="list-style-type: none"> <li>• Availability</li> <li>• Time</li> <li>• Loss of commitment</li> <li>• Access to treatment resources</li> <li>• Funding</li> </ul>	<ul style="list-style-type: none"> <li>• Planned sharing of information</li> <li>• Negotiations conducted</li> <li>• Communicate funding opportunities when available</li> </ul>	<ul style="list-style-type: none"> <li>• Feedback</li> <li>• Commitment to implement agreed controls</li> <li>• Highly engaged</li> <li>• Treatments being completed</li> </ul>
<b>As required</b>	Stakeholders – Others	1 – 3 & 5	<ul style="list-style-type: none"> <li>• Face to face</li> <li>• Presentations</li> <li>• Community Engagement</li> <li>• Telephone</li> <li>• Email</li> </ul>	<ul style="list-style-type: none"> <li>• Inform and consult</li> <li>• Confirm accountability and responsibility</li> <li>• Status and progress of plan</li> <li>• Treatment status</li> <li>• Gaps and issues to be addressed</li> </ul>	CEO or Delegate	<ul style="list-style-type: none"> <li>• Availability</li> <li>• Time</li> <li>• Loss of commitment</li> </ul>	<ul style="list-style-type: none"> <li>• Planned sharing of information</li> <li>• Negotiations conducted</li> <li>• Communicate funding opportunities when available</li> </ul>	<ul style="list-style-type: none"> <li>• Feedback</li> <li>• Commitment to implement agreed controls</li> <li>• Highly engaged</li> <li>• Treatments being completed</li> </ul>
<b>Annually or as required</b>	OBRM, DFES District / Regional Office	1 – 3	<ul style="list-style-type: none"> <li>• Face to face meetings</li> <li>• Email</li> <li>• Telephone</li> </ul>	<ul style="list-style-type: none"> <li>• UCL/UMR Management</li> <li>• Status and progress of plan</li> </ul>	CEO or Delegate	<ul style="list-style-type: none"> <li>• Time</li> <li>• Conflicting priorities</li> </ul>	<ul style="list-style-type: none"> <li>• Schedule communication opportunities</li> </ul>	<ul style="list-style-type: none"> <li>• Planned works identified</li> </ul>

				<ul style="list-style-type: none"> <li>• Treatment status, gaps and issues to be addressed</li> <li>• Continuous improvement</li> <li>• Information sharing</li> <li>• Identification of other planned works</li> <li>• Identification of funding opportunities</li> </ul>				<ul style="list-style-type: none"> <li>• Improvements identified and implemented</li> <li>• Issues addressed</li> </ul>
<b>Annually</b>	OBRM	1,22	<ul style="list-style-type: none"> <li>• Written report</li> </ul>	<ul style="list-style-type: none"> <li>• Governance and compliance</li> <li>• Continuous improvement</li> </ul>	CEO or Delegate	<ul style="list-style-type: none"> <li>• Time</li> <li>• Conflicting priorities</li> </ul>	<ul style="list-style-type: none"> <li>• Plan communication</li> </ul>	<ul style="list-style-type: none"> <li>• Compliance requirements met</li> </ul>
<b>Annually – ideally prior to fire season</b>	Community	5	<ul style="list-style-type: none"> <li>• Newsletter</li> <li>• Website</li> <li>• Facebook</li> </ul>	<ul style="list-style-type: none"> <li>• Continuous improvement</li> </ul>	CEO or Delegate	<ul style="list-style-type: none"> <li>• Time</li> <li>• Conflicting priorities</li> </ul>	<ul style="list-style-type: none"> <li>• Plan communication</li> </ul>	<ul style="list-style-type: none"> <li>• Feedback received</li> </ul>
<b>Review of the BRM Plan and Treatment Schedule</b>								
<b>Timing of Communication</b>	<b>Stakeholder (s)</b>	<b>Communication Objectives</b> <i>(Refer to Page 64)</i>	<b>Communication Method</b>	<b>Key Message or Purpose</b>	<b>Responsibility</b>	<b>Identified Risks to Communication</b>	<b>Strategy to Manage Risks</b>	<b>Monitoring &amp; Evaluation Method</b>
<b>Annually</b>	Shire of Cuballing CEO, Senior Leadership Team and Council	4, 5	<ul style="list-style-type: none"> <li>• Email</li> <li>• Face to face meetings</li> </ul>	<ul style="list-style-type: none"> <li>• Governance and compliance</li> <li>• Review, monitoring and reporting to Council</li> <li>• Status update</li> <li>• Continuous improvement</li> </ul>	CEO or Delegate	<ul style="list-style-type: none"> <li>• Poor reporting and recording of information</li> </ul>	<ul style="list-style-type: none"> <li>• BRPC &amp; BRMO to record data and information appropriately</li> </ul>	<ul style="list-style-type: none"> <li>• Feedback received</li> <li>• Planned works completed</li> <li>• Reporting &amp; Statistics</li> <li>• Risk ratings reduced</li> </ul>
<b>5 Yearly (Shire, DFES and OBRM)</b>	OBRM & LG Council	4, 5	<ul style="list-style-type: none"> <li>• Email</li> <li>• Face to face meetings</li> <li>• Telephone</li> <li>• Written report</li> </ul>	<ul style="list-style-type: none"> <li>• Governance and compliance</li> <li>• Review, monitoring and reporting</li> <li>• Future planning</li> </ul>	CEO or Delegate	<ul style="list-style-type: none"> <li>• Poor reporting and recording of information</li> <li>• Review not completed by OBRM</li> </ul>	<ul style="list-style-type: none"> <li>• BRPC &amp; BRMO to record data and information appropriately</li> <li>• Endorsed by OBRM</li> </ul>	<ul style="list-style-type: none"> <li>• Feedback received</li> <li>• Planned works completed</li> <li>• Reporting &amp; Statistics</li> <li>• Risk ratings reduced</li> </ul>

<b>Quarterly or as required</b>	Shire of Cuballing – Building and Works	4, 5	<ul style="list-style-type: none"> <li>• Face to face meetings</li> </ul>	<ul style="list-style-type: none"> <li>• Report on actions and status of BRM Plan</li> <li>• Continuous improvement</li> </ul>	CEO or Delegate	<ul style="list-style-type: none"> <li>• Time</li> <li>• LG capacity</li> <li>• Conflicting priorities</li> </ul>	<ul style="list-style-type: none"> <li>• Plan Communication</li> <li>• Discuss with Shire Leadership Team</li> </ul>	<ul style="list-style-type: none"> <li>• Feedback on work completed</li> <li>• Risk ratings reduced</li> <li>• Improvements identified and implemented</li> </ul>
<b>Biannually or as required</b>	DFES Regional / District Office	4, 5	<ul style="list-style-type: none"> <li>• Face to face meetings</li> <li>• Email</li> <li>• Telephone</li> </ul>	<ul style="list-style-type: none"> <li>• Report on actions and status of BRMP</li> <li>• Continuous improvement</li> <li>• UCL/UMR funding</li> </ul>	CEO or Delegate	<ul style="list-style-type: none"> <li>• Time</li> <li>• LG capacity</li> <li>• Conflicting priorities</li> </ul>	<ul style="list-style-type: none"> <li>• Plan communications</li> </ul>	<ul style="list-style-type: none"> <li>• Feedback on work completed</li> <li>• Risk ratings reduced</li> <li>• Improvements identified and implemented</li> </ul>
<b>Annually</b>	BFAC, ROAC, LEMC, CBFCO, Captains	4, 5	<ul style="list-style-type: none"> <li>• Face to face meetings</li> <li>• Email</li> <li>• Telephone</li> <li>• Presentations</li> </ul>	<ul style="list-style-type: none"> <li>• Report on actions and status of BRMP</li> <li>• Continuous improvement</li> </ul>	CEO or Delegate	<ul style="list-style-type: none"> <li>• LG capacity</li> <li>• Time</li> <li>• Conflicting priorities</li> <li>• Buy in</li> </ul>	<ul style="list-style-type: none"> <li>• Keep informed</li> <li>• Share the wins</li> </ul>	<ul style="list-style-type: none"> <li>• Feedback on work completed</li> <li>• Risk ratings reduced</li> <li>• Improvements identified and implemented</li> </ul>
<b>Every 2 years or as required</b>	Stakeholders – Land Owners / Land Managers	4, 5	<ul style="list-style-type: none"> <li>• Face to face meetings</li> <li>• Telephone</li> <li>• Presentation</li> <li>• Community Engagement</li> <li>• Survey</li> </ul>	<ul style="list-style-type: none"> <li>• Status of treatments</li> <li>• Success of treatments</li> <li>• Continuous improvement</li> </ul>	CEO or Delegate	<ul style="list-style-type: none"> <li>• LG capacity</li> <li>• Time</li> <li>• Conflicting priorities</li> <li>• Buy in</li> <li>• Access to resources</li> </ul>	<ul style="list-style-type: none"> <li>• Plan communication</li> <li>• Target communication</li> <li>• Planned and prepared</li> </ul>	<ul style="list-style-type: none"> <li>• Feedback on work completed</li> <li>• Risk ratings reduced</li> <li>• Improvements identified and implemented</li> </ul>
<b>Every 2 years or as required</b>	Stakeholders – Other	4, 5	<ul style="list-style-type: none"> <li>• Face to face meetings</li> <li>• Telephone</li> <li>• Presentations</li> <li>• Community Engagement</li> <li>• Survey</li> </ul>	<ul style="list-style-type: none"> <li>• Status of treatments</li> <li>• Success of treatments</li> <li>• Continuous improvement</li> </ul>	CEO or Delegate	<ul style="list-style-type: none"> <li>• LG capacity</li> <li>• Time</li> <li>• Conflicting priorities</li> <li>• Buy in</li> <li>• Access to resources</li> </ul>	<ul style="list-style-type: none"> <li>• Plan communication</li> <li>• Target communication</li> <li>• Planned and prepared</li> </ul>	<ul style="list-style-type: none"> <li>• Feedback on work completed</li> <li>• Risk ratings reduced</li> </ul>



									<ul style="list-style-type: none"><li>• Improvements identified and implemented</li></ul>
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## Appendix 2 – Local Government-Wide Controls and Multi-Agency Work Plans

Control	Action or Activity Description	Lead Agency	Other Stakeholder(s)	Notes and Comments	
1.	BRMP Risk Analysis	<ul style="list-style-type: none"> <li>Maintain and refine BRM Plan</li> </ul>	Shire of Cuballing	Landowners DFES	Treatment identification and planning for all very high and extreme risk assets within the Shire.
2.	Shire of Cuballing Bush Fire Notice ( <i>Bush Fires Act 1954</i> )	<ul style="list-style-type: none"> <li>Review annual notice</li> <li>Publish annual notice</li> <li>Inspections in accordance with annual notice</li> </ul>	Shire of Cuballing	CBFCO, FCO, Captains and the public	Published Annually. Inspect local properties. 'Fire Access Track' has the same meaning as 'Fire Break', in the <i>Bush Fires Act 1954</i> .
3.	Shire Prohibited and Restricted burn times and issuing of permits. ( <i>Bush Fires Act 1954</i> )	<ul style="list-style-type: none"> <li>Restricted and Prohibited Burn Times set the requirement that 'a permit to set fire to the bush' must be obtained.</li> </ul>	Shire of Cuballing	CBFCO, FCO's	Published Annually.
4.	Harvest and Vehicle Movement Bans	<ul style="list-style-type: none"> <li>Bans imposed when the CBFCO and FCO's are of the opinion that the use of engines, vehicles, plant or machinery is likely to cause/contribute to the spread of a bushfire.</li> </ul>	Shire of Cuballing	CBFCO and FCO's	A Harvest and Vehicle Movement Ban may be imposed for any length of time but is generally imposed for the 'heat of the day' periods and may be extended or revoked by the local government should weather conditions change.
5.	Local Emergency Management Arrangements	<ul style="list-style-type: none"> <li>Local Emergency Management Arrangements</li> </ul>	Shire of Cuballing	St John Ambulance (SJA) WAPOL DFES Dept of Child Protection Dept of Education CBFCO Gt Southern DEMC OEM Shire of Wickepin	Annual review of emergency plans and arrangements.
6.	State Planning Policy 3.7 and Local Planning Scheme No 2	<ul style="list-style-type: none"> <li>Planning in Bushfire Prone Areas</li> </ul>	Dept of Planning	Shire of Cuballing WA Planning Commission DFES	Land developers are required to implement a Fire Management Plan to ensure risk is managed and other controls implemented and monitored.

Control	Action or Activity Description	Lead Agency	Other Stakeholder(s)	Notes and Comments	
		<ul style="list-style-type: none"> <li>Requirement for new developments to complete a Fire Management Plan endorsed through the Dept of Fire and Emergency Services (if in a Bushfire Prone area)</li> </ul>			Where a Fire Management Plan has been endorsed by DFES and the Shire, the affected land owners will be responsible for the ongoing implementation of the “land owners’ responsibilities” as specified in that Fire Management Plan.
7.	Total Fire Bans	<ul style="list-style-type: none"> <li>Restriction of activities that may cause or contribute to the spread of a bushfire</li> </ul>	Department of Fire and Emergency Services	Shire of Cuballing	A Total Fire Ban (TFB) is declared because of extreme weather conditions or when widespread fires are stretching firefighting resources. A TFB is declared by DFES subject to weather conditions.
8.	Public preparedness and education campaigns	<ul style="list-style-type: none"> <li>Public preparedness and education campaign</li> </ul>	Shire of Cuballing	DFES, WA Police, WA Government CBFCO, FCO, community	Local promotion activities of state campaigns held when opportunity arises to promote preparedness including local contractors, bushfire brigades and Bushfire Ready Groups

## Appendix 3 – Indicative Vegetation of the Narrogin District

The following has been taken from the publication Landscapes and soils of the Narrogin District, D.N. Sawkins, Bulletin 4807, 2010:

*Landscapes and soils of the Narrogin district*

### Indicator vegetation of the Narrogin district

**Tree** - single trunk, with branches that usually start more than 1 meter above the ground and occupy about half of the tree's height. If the main trunk is damaged, many branches can resprout from the base or stems (epicormic growth). Examples include salmon and York gums, wandoo, marri and jarrah.

**Mallet** - single trunk with relatively steep angled branches and a terminal crown. Mallets are sensitive to fire and do not recover if the main trunk is lost. Examples include mallets, yates, gimlet and moort. Mallets often occur as pure or massed stands.

**Mallee** - multi stemmed plants usually less than 10 meters high. Several stems come from a lignotuber that can replace them when one or more are lost. Mallees that have not had to regenerate may have a single stem, but also have the basal 'mallee root'.



**Salmon gum** (*E. salmonophloia* left, RDZ and ADZ) and **gimlet** (*E. salubris* right, ADZ, note fluted stem) are common on clay, clay loam soils and loamy duplex soils on slopes and valleys. Salmon gums often dominate on loamy duplex and deep loam soils, and gimlets on heavier clay soils.

Buds and fruit can differentiate salmon gum from similar looking species like silver mallet.



Salmon gum

Silver mallet

Brown mallet

Blue mallet

**Silver mallet** (*E. argyphaea*) grows on stony usually mafic gravel uplands, in the east of the district. It can be mistaken for salmon gum, but only occurs on upland gravels, has the characteristic mallet form, and distinctive buds.

**Blue mallet** (*E. gardneri*) often occurs with silver mallet, mainly on mafic stony uplands.

**Brown mallet** (*E. astringens*) is the most common mallet in this district. It is common below breakaways on poorly structured mottled zone soils ('mallet' soils), and may occur with silver and blue mallets.



Silver mallet (silver bark green shiny leaves) with blue mallet (brown bark dull blue green leaves)



Silver mallet (silver bark) with brown mallet (brown bark), both with shiny green leaves



**Red morrel** (*E. longicornis*) is an upright rough barked tree that occurs on the following aeolian or mafic soils

- (1) Soils formed on mafic rock uplands in the RDZ and ADZ. Red brown stony and loamy gravels grading to gravelly loams with alkaline subsoils.
- (2) Aeolian loamy soils usually on the west and southern sides of trunk valleys in the ADZ.
- (3) Duplex soils with a brown subsoil on slopes.

York gum can be distinguished from red morrel by its generally rougher bark and more branching form. There are several species of trees and mallees with a stocking of rough bark that occur on alkaline valley soils (often aeolian loams), and red brown clay loam soils north and east of Harrismith. These include Yorrel (*E. yilgarnensis* syn Beard *E. gracilis*), *E. myriadena* (syn Beard *E. ovularis*).

These species all have shiny leaves and rough bark, but can be differentiated from York gum by narrower leaves and smaller fruit.

DRZ = Darling Range Zone, RDZ = Rejuvenated Drainage Zone, ADZ = Ancient Drainage Zone



**York Gum** (*E. loxophleba*) has 3 types in the Narrogin district. They all have characteristic shiny green leaves but differ in their form and bark characteristics.

*Ssp. loxophleba* (tree with rough bark on whole stem) is the most common form and occurs mainly on loamy soils formed from crystalline rock (usually with jam *Acacia acuminata*).

*Ssp. lissophloia* is the smooth bark mallee form that occurs on lower slopes and valleys, generally on loams or loamy duplex soils often with salmon gum and gimlet east and north of Jitarning, and is common in the Merredin district.

An intergrade form that has rough bark part way up the stem is common in the Corrigin and Kukerin systems.

On the left is York gum (*E. loxophleba ssp. loxophleba*) with jam understorey.



York gum mallee (*E. loxophleba ssp. lissophloia*.)



Intergrade form



**Flooded gum** (*E. rudis* left) is a multi-branched tree that occurs on winter wet soils that were originally non saline, mainly in valleys and granitic duplex slopes in the DRZ and western RDZ.

Many waterways with flooded gum have become mildly saline. These areas and fresh seepages have often been colonised by the introduced weed Spiny rush (*Dacutus spp*) below.



**Wandoo** (*E. wandoo subsp. wandoo*) is widespread, ranging from gravels (in association with dryandras, jarrah and marri), to valley duplex soils. Where wandoo is the dominant vegetation it often indicates deep or grey sandy duplex and gravelly duplex soils. With other vegetation, it usually becomes more dominant when the soil becomes more duplex. Wandoo is widespread on lower slopes and sandy duplex valleys, often in association with salmon gum and rock sheoak.

Salmon gums dominate on very shallow sandy duplex, clay or calcareous duplex soils, with wandoo being more common sandy duplexes in deeper sandy duplexes, and rock sheoak on very deep sandy duplex patches.

Salmon gums with their shiny leaves and layered foliage can be readily distinguished from dull leaved wandoos with bunchy foliage.



Sandy duplex wandoo woodland



Broad valley with salmon gum flanked by two wandoos



**Powder-bark wandoo** (*E. accedens* left) generally occurs in the west of the RDZ north of Williams on breakaways and stony ridges. It often occurs near brown mallet. Both are typical of highly water repellent soils.

Powder-bark wandoo can be distinguished from wandoo by its powdery smooth bark, and much brighter white-seasonally pink bark. Wandoo bark colour is generally steel grey-yellow



Powder-bark wandoo

Wandoo

**Jarrah** (*E. marginata*) (below) occurs in the gravelly uplands in the DRZ and western RDZ. It indicates very gravelly and sandy gravelly soil, often with ironstone ridges, associated with marri and dryandras, but can also occur on deep pale sands.



**Marri** (*Corymbia calophylla*) occurs on gravelly rises and slopes in the DRZ and western RDZ, often down-slope of jarrah or dryandra ironstone ridges. It may be intermixed with jarrah on gravelly rises or wandoo on gravelly duplex soils. It generally grows on better water holding soils than jarrah, but can occur on deep grey sand over gravel.



**Jam** (*Acacia acuminata*) often occurs with York gum and rock sheoak, and can dominate in shallow granitic and mafic soils, with another less common wattle (*Acacia saligna*.) Sometimes it can be scattered in lower slope sandy duplex soils in dissected landscapes.

**Manna wattle** (*Acacia microbotrya*) can be mistaken for jam, as they often occur together. However unlike jam, manna wattle can occur on a wide range of soils, including lateritic gravels and sands.

Plant differences are that jam has slender pointed leaves, rod shaped flowers, and flowers in spring; while manna wattle has broader sickle-shaped leaves, ball flowers and flowers in late autumn.





**Mallees** are most common in the ADZ and eastern RDZ). The eastern edge of the district is the start of the mallee zone with widespread mallee duplex soils. Mallee scrub with melaleuca understorey usually indicates duplex or shallow soils (e.g. near breakaways, and rocky, or hard setting areas).

A few species - mottlecah (*E. macrocarpa*), white mallee (*E. albidata*), ridge fruited mallee (*E. incrassata*), and mallee white gum (*E. phaenophylla*) occur with sandplain and gravel heath

Apart from a few easily identifiable species like mottlecah, it is difficult to associate the many species with soil type without species identification keys. You can gain an idea of soil type by noting the type of understorey in conjunction with landscape clues like slope, rock fragments, and topsoil features.



**Mottlecah** (*E. macrocarpa*) is commonly found on yellow sandy soils and some pale gravelly sands in ADZ



**White mallee** (*E. albidata*) is found in the same areas as Mottlecah on grey sandy laterites



**Mallee scrub**; shallow hard-setting mallee duplex soil with sparse understorey



**Mallee scrub**; shallow sandy duplex with dense melaleuca understorey



**Melaleucas** occur in all zones and many landscape positions. They are common on mallee duplex soils, or soils that can be winter wet. Where melaleucas are the dominant vegetation, they often indicate soils that are waterlogged in winter

The plants shown are from the frequently occurring *Melaleuca uncinata* group.



**Sheoaks** (small trees) and **Tammas** (mainly shrubs) have needle type foliage with separate male (pollen) and female ('nut') plants. Salt sheoak (*Casuarina obesa*) favours saline and wet areas, but the others are *Allocasuarina* species that indicate well drained sandy or gravelly soils.

Rock sheoak (*Allocasuarina huegeliana*) is widespread. Before agriculture, it was mainly on granitic sandy surfaced soils, sandy gravels and deep sandy duplex soils. However it has colonised many different well drained soils on roadsides.

Black tamma (*Allocasuarina acutivalvis*) occurs mainly on mafic and yellow stony and shallow gravels, in the east of the district.

Tamma, the most common tamma (*Allocasuarina campestris*) occurs with black tamma, but tends to be more common in deeper or loamier gravels and yellow earths.



Rock sheoak

Salt sheoak with samphire near a salt lake



Tamma

Black tamma

Male tamma with pollen and typical needle like foliage

## Sandy soil vegetation



**Roadside tea tree** (*Leptospermum erubescens*) is common on well drained sandy surfaced soil. Tea trees are common on deep grey sands, but are colonising species that have spread on well drained disturbed areas.



**Christmas tree** (*Nuytsia floribunda* left) an indicator of deep grey sandy soils, with **sheoak** (*Allocasuarina fraseriana* right) that occurs on Darling Range sands and sandy gravels.



**Sandplain cypress** (*Actinostrobus arenarius*) often occurs in sandy soil, particularly yellow aeolian deep sands with Acorn banksia and woody pear



**Woody Pear** (*Xylomelum angustifolium*) occurs mainly on smooth slopes and crests and in dunes adjoining salt lakes and old drainage lines, mainly north and east of Pingelly.

It often occurs with banksias, sandplain cypress, roadside tea tree and sandplain heath. It indicates aeolian deep yellow sands. The image on the left shows woody pear with tamma.

**Proteaceous species** are major components of lateritic and sandy heaths, and as understorey species are a good guide to differentiating mallee duplex gravels from other duplexes.

**Banksias** are generally a good guide to sandy gravel and deep sandy soils.



Bull banksia (*Banksia grandis*) is a common tree on Darling Range gravels



Acorn banksia (*B. prionotes*) is a common tree on aeolian yellow sand



Sphere banksia (*B. sphaerocarpa*) is a shrub found in many sand and gravel heaths



Woolly banksia (*B. baueri*) is a feature of lateritic grey sandy soils to the east.

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**Grevilleas** are also noticeable in lower rainfall sandplain heath, particularly yellow sand over gravel, but also occur on other well drained upland soils.



Flame grevillea (*G. eriostachya*) is a feature of yellow sandplain.



Hookers grevillea (*G. hookeriana*) is a feature of yellow sand over gravel soils.

**Hakeas** have similar flowers to grevilleas, but have a persistent woody fruit (see below). They are very common on sandy gravel to shallow and loamy gravel soils, but can occur on a range of soils. Needle hakea (*Hakea preissii*) occurs on red clay soils)



Fan leaf hakea  
(*Hakea brownii*)

Marble hakea  
(*Hakea incrassata*)

Honeybush  
(*Hakea lissocarpa*)

**Dryandras** (now in the *Banksia* genus) with their prickly vegetation are a noticeable feature of shallow gravel and sandy gravel soils.



Parrot bush (*Banksia sessilis*) is common on Darling Range gravels.

Prickly dryandra (*Banksia armata*) is widespread on shallow gravels

Dryandra rich shallow sand over gravel vegetation near Harrismith.

**Other sandplain Proteaceae**



Stinkwood (*Jacksonia sternbergiana*) is common on deep grey sandy soils

Chittick (*Lambertia inermis*) is common on grey sand over gravel soils in the south east

Woolly bush (*Adenanthos sericea*) is also common on deep grey sandy soils.

## Appendix 4 – Declared Rare Flora and Fauna in the Shire of Cuballing

The following has been taken from the Protected Matters Report produced by the Federal Department of Agriculture, Water and the Environment in March 2020. This report provides general guidance on matters of national environment significance and other matters protected by the *Environmental Protection and Biodiversity Conservation (EPBC) Act 1999*.

Threatened Ecological Communities		[ Resource Information ]
For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.		
Name	Status	Type of Presence
<a href="#">Eucalypt Woodlands of the Western Australian Wheatbelt</a>	Critically Endangered	Community likely to occur within area
Threatened Species		[ Resource Information ]
Name	Status	Type of Presence
<b>BIRDS</b>		
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calyptorhynchus banksii naso</a> Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat may occur within area
<a href="#">Calyptorhynchus baudinii</a> Baudin's Cockatoo, Long-billed Black-Cockatoo [769]	Endangered	Species or species habitat likely to occur within area
<a href="#">Calyptorhynchus latirostris</a> Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
<a href="#">Leipoa ocellata</a> Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area
<b>MAMMALS</b>		
<a href="#">Bettongia lesueur lesueur</a> Burrowing Bettong (Shark Bay), Boodie [66659]	Vulnerable	Translocated population known to occur within area
<a href="#">Bettongia penicillata ogilbyi</a> Woylie [66844]	Endangered	Species or species habitat known to occur within area
<a href="#">Dasyurus geoffroii</a> Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Macrotis lagotis</a> Greater Bilby [282]	Vulnerable	Translocated population known to occur within area
<a href="#">Myrmecobius fasciatus</a> Numbat [294]	Endangered	Species or species habitat known to occur within area
<a href="#">Phascogale calura</a> Red-tailed Phascogale, Red-tailed Wambenger, Kenngoor [316]	Vulnerable	Species or species habitat known to occur

## PLANTS

<a href="#">Acacia cochlocarpa subsp. cochlocarpa</a> Spiral-fruited Wattle [23877]	Endangered	Species or species habitat may occur within area
<a href="#">Acacia insolita subsp. recurva</a> Yormaning Wattle [64495]	Endangered	Species or species habitat known to occur within area
<a href="#">Banksia cuneata</a> Matchstick Banksia, Quairading Banksia [9827]	Endangered	Species or species habitat known to occur within area
<a href="#">Banksia oligantha</a> Wagin Banksia [20697]	Endangered	Species or species habitat likely to occur within area
<a href="#">Boronia capitata subsp. capitata</a> a shrub [29156]	Endangered	Species or species habitat likely to occur within area
<a href="#">Caladenia hoffmanii</a> Hoffman's Spider-orchid [56719]	Endangered	Species or species habitat may occur within area
<a href="#">Darwinia carnea</a> Mogumber Bell, Narrogin Bell [9736]	Endangered	Species or species habitat likely to occur within area
<a href="#">Diuris micrantha</a> Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat may occur within area
<a href="#">Eleocharis keigheryi</a> Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Grevillea dryandroides subsp. hirsuta</a> Hairy Phalanx Grevillea [64577]	Endangered	Species or species habitat likely to occur within area
<a href="#">Grevillea scapigera</a> Corrigin Grevillea [12195]	Endangered	Species or species habitat may occur within area
<a href="#">Pultenaea pauciflora</a> Narrogin Pea [14013]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Roycea pycnophylloides</a> Saltmat [21161]	Endangered	Species or species habitat likely to occur within area
<a href="#">Thelymitra dedmanianum</a> Cinnamon Sun Orchid [65105]	Endangered	Species or species habitat may occur within area
<a href="#">Thomasia montana</a> Hill Thomasia [12136]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Verticordia fimbriolepis subsp. fimbriolepis</a> Shy Featherflower [24631]	Endangered	Species or species habitat known to occur within area

### Migratory Terrestrial Species

[Motacilla cinerea](#)

Grey Wagtail [642]

Species or species habitat  
may occur within area

### Migratory Wetlands Species

[Actitis hypoleucos](#)

Common Sandpiper [59309]

Species or species habitat  
may occur within area

[Calidris acuminata](#)

Sharp-tailed Sandpiper [874]

Species or species habitat  
may occur within area

[Calidris ferruginea](#)

Curlew Sandpiper [856]

Critically Endangered

Species or species habitat  
may occur within area

[Calidris melanotos](#)

Pectoral Sandpiper [858]

Species or species habitat  
may occur within area