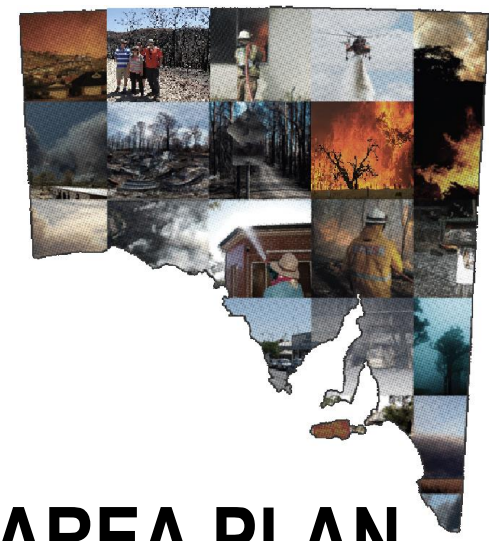
MURRAY MALLEE



BUSHFIRE MANAGEMENT AREA PLAN

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Government of South Australia

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River Murray at Mannum: photograph provided by Paul Saffi, CFS Bushfire Management Planning Unit

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Document Control

Version	Date	Summary of Changes	Author

Endorsements

This document requires the following endorsements by the Murray Mallee BMC

Version	Date	Name	Title	Signature

Approvals

This document requires the following approvals:

Version	Date	Name	Title	Signature

Distribution

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1 INTRODUCTION

Bushfire cannot be eliminated from the landscape, and there are circumstances when fire cannot be controlled, however planning and preparedness activities can reduce the frequency, spread and impact of bushfire events. The Murray Mallee (MURRM) is a bushfire prone environment with people, assets and areas of environmental sensitivity. The *Fire and Emergency Services Act 2005 (FES Act 2005),* outlines the responsibilities of key Government organisations, the community and the public to prepare for, prevent or inhibit the spread of any bushfire.

The Murray Mallee Bushfire Management Area Plan (BMAP) comprises of three parts:

- This written component outlining the planning process, content and other relevant information.
- An interactive spatial we-based map that identifies assets and their risk levels, and includes pop up tables of information for each asset.
- A spreadsheet containing a list of all MURRM BMAP assets, their risk rating and risk mitigation treatments strategies.

Prevention and preparedness are vital components in reducing injuries and deaths, loss of assets, financial costs and aiding community recovery. The MURRM BMAP is aimed at prevention and preparedness planning, processes and actions. The Plan outlines information, strategies and actions to prevent or mitigate (reduce) bushfire impact on assets and in the landscape, rather than focussing on the business continuity, emergency response or replacement costs.

The MURRM BMAP utilises a web-based (electronic) style and methodology that enables it to be updated on a regular and ongoing basis following its initial approval and publication. The MURRM Bushfire Management Committee (BMC) ensures the Plan is regularly reviewed and updated and that public consultation processes are undertaken where required. *(Refer to Section 3: Roles and Responsibilities).*

This BMAP has been prepared under specifications as determined by the current State Bushfire Management Plan 2010, the State Bushfire Coordination Committee (SBCC), Bushfire Management Committees, and the CFS Bushfire Management Planning Unit. The State Bushfire Management Plan is a strategic level document designed to provide policy and direction for fire, emergency and land management agencies and Bushfire Management Committees in South Australia. The State Bushfire Management Plan is a requirement under *Section 73 of the FES Act 2005*, and sets the standards for preparation and implementation of the BMAPs. At time of publication of this draft

MURRM BMAP, the approved State Bushfire Management Plan is being reviewed and updated with an expected completion date in 2017. Any updates to the State plan that require changes to be made to existing BMAPs will be incorporated in the regular BMAP update processes undertaken by the BMCs.

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1.1. Purpose and Scope

The *Fire and Emergency Services Act 2005 (FES Act 2005)* requires each of the nine South Australian Bushfire Management Committees (BMC's) to prepare and maintain a BMAP. Each BMC will adopt a BMAP that will:

- Identify existing or potential risk to assets from bushfire within the BMA
- Outline coordinated and cooperation bushfire prevention and mitigation strategies to achieve appropriate hazard reduction associated with bushfire management within its area
- Identify asset or land custodians responsible for the implementation of bushfire risk mitigation treatments
- Use or establish principles and standards to guide or measure the success of the bushfire management strategies and initiatives.

The purpose of the MURRM BMAP is to provide strategic direction for bushfire management planning in the MURRM Bushfire Management Area (BMA) (refer to location map on page 7), through the identification of strategies for bushfire risk modification to selected assets and area and across the landscape regardless of tenure. The Plan will be used by State and Local Government land management organisations to guide the development of bushfire management work plans for areas of land under their responsibility. Local government work plans will guide the establishment/development of bushfire mitigation works on private lands. The Plan also provides essential inputs into state and local government planning, the application of building codes, fire fuel management, planning for emergency management response, and prioritising of resources for sound mitigation decisions.

Following an assessment of bushfire risks and the adequacy of current control measures within the MURRM BMAP, additional risk treatment strategies have been determined that aims to improve the resilience of the wider community and the assets identified in the plan. *(Refer to Section 4: Risk Assessment and Section 5: Risk Treatment Strategies Suite).*

The scope of the MURRM BMAP encompasses a range of asset categories and landscape wide areas of potential bushfire risk. Asset categories include areas of human settlement; industrial and business areas; and assets of cultural significance to local communities or the State. *(Refer to Section 4.1: Assets at Risk from Bushfire)*. Environmental assets are to be incorporated in to the BMAP at a later stage. *(Refer to Section 4.2.4: Environment).* Selected areas of bushfire concern that relate to multiple assets or the movement of bushfire through the broader landscape have been included and mapped as Landscape Treatment Investigation Areas. These proposed areas of investigation require further assessment and consultation with stakeholders to determine the most effective, acceptable and achievable vegetation management strategies to directly reduce the intensity and movement of fire though the landscape and the impact of bushfire on a cluster of assets.

Bushfire safety requires a partnership approach and is a shared responsibility between government agencies, private sector, non-government organisations, individual and the wider community. The planning process ensures consultation strategies provide all stakeholders with the opportunity to contribute to fire management planning and thus undertake appropriate action to address the risk of bushfire.

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1.2 Objective

The protection of people, property and the environment is the fundamental objective of this plan, as a shared responsibility between government and the community. Community members and organisations are required to contribute to mitigating bushfire risk. The risk assessment process focusses predominantly on what can be measured (vegetation, fire intensity, separation distances, weather, topography, building resilience, access routes etc.) and what can be managed by applying risk treatment strategies.

The objective of this plan is to:

- Document the identification and assessment of the bushfire risk to assets within the MURRM BMA;
- Capture current and proposed risk treatment strategies;
- Identify those asset or land custodians responsible for implementing risk treatment strategies to manage the risks and reduce the community's vulnerability to bushfire by improving preparedness utilising local knowledge, experience and expertise;
- Support and inform planning at a local level; and
- Inform stakeholders of the potential bushfire risk within the MURRM BMA.

Assessment of the strategies to protect other assets within the MURRM BMA will need to be reviewed as the strategies are implemented.

1.2.1 Constraints, Assumptions and Exclusions

The BMAPs are developed specifically for bushfire planning and preparedness. Issues relating to operational bushfire response or recovery are not addressed in this plan but are covered in plans, policies and procedures of government and non-government emergency and community service agencies.

It is not currently feasible to risk assess every building or parcel of land for the inclusion into the MURRM online BMAP. Although some individual privately owned residences, farms, small business etc., are not specifically identified in the Plan's online map by a point, polygon or line, they will still have a level of risk from bushfire. Every landholder has a responsibility to undertake bushfire prevention and preparedness activities relevant to their location and situation.

The initial list of Landscape Treatment Investigation Areas *(Refer to Section 1.1: Purpose and Scope* and *Section 5.2.1: Landscape Risk Treatment and Investigation Areas),* does not represent an exhaustive or priority-based list of all potential landscape treatment investigation areas. Additional areas may be included following further risk assessment, identification and consultation with affected landowners. This includes identifying and assessing risk treatment strategies to determine their impact on significant species and communities.

A formal process for the risk assessment of environmental assets is being developed for application in BMAPs. The CFS and DEWNR are prioritising this work. Data on environmental assets is held in the Biological Databases of South Australia (BDBSA). It is planned to have the completed environmental asset information and related management strategies incorporated in future iterations of the BMAP. *(Refer to Section 4.2.4: Environment).*

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The BMAP process recognises the rights, interests and obligations of the traditional owners to speak and care for their traditional lands in accordance with their customary laws, beliefs and traditions. However on the advice of the Department of the Premier and Cabinet – Aboriginal Affairs and Reconciliation Division (AARD), to prevent damage, disturbance or interference with any Aboriginal site or object, assets of Aboriginal cultural and spiritual significance will not be specifically identified in this iteration of the plan. Further consultation with relevant stakeholders will be undertaken on the methodology for including assets of Aboriginal significance in the Plan.

This MURRM BMAP does not include details for implementation, monitoring, review or reporting. Documentation on these requirements is under development and will be set out in the State Bushfire Management Plan and undertaken as part of the BMAP implementation process.

Weather conditions play a significant role in the likelihood of a bushfire occurring and its behaviour and intensity should it establish and spread. Information derived from Bureau of Meteorology (BOM) weather data from October to April for the last 5-7 years for the fire ban districts in each bushfire management area throughout the state has been used with other inputs in determining risk assessment outcomes.

Formulas and data used during risk assessment workshops and in the development of this plan have been based on the best available information at the time of development, and may be subject to change over time as more accurate data and information becomes available.

The FES Act 2005 Section 127 protects stakeholders from liability in relation to the development and implementation of a BMAP. *Please refer to Section 1.3.1: Fire and Emergency Services Act* for more information.

1.2.2 Considerations in developing the Bushfire Management Area Plan

The following considerations have been applied in the development of the BMAP:

- Primacy of the protection and preservation of life
- Protection of critical infrastructure and community assets that support community resilience
- Protection of residential property as a place of primary residence
- Protection of assets supporting livelihoods, economic production and community financial sustainability
- Protection of cultural assets
- The development of a formal process for the risk assessment and inclusion of identified environmental and conservation assets into forthcoming updates of the BMAP
- Compliance with relevant Acts and Regulations
- Alignment to Standards and Codes of Practice relevant to bushfires and bushfire planning. Please refer to the section on Related Documents at the end of this BMAP for more information.

1.3. Legislation

1.3.1 Fire and Emergency Services Act

A BMAP is a requirement under the *FES Act 2004 Section 73A*. In particular *Section 73A (1)* requires the BMC to prepare and maintain a BMAP for its areas. *Section 73A (3)* outlines that the BMAP must:

a. Identify existing or potential risks to people and communities within its area from bushfire; and
b. Outline strategies to achieve appropriate hazard reduction associated with bushfire management within its area, especially through a coordinated and cooperative approach to bushfire prevention and mitigation; and
c. Identify action that should be taken by people, agencies and authorities to achieve appropriate standards of bushfire management within its area; and
d. Without limiting points (b) and (c), establish or adopt principles and standards to guide or measure the successful implementation of bushfire management strategies and initiatives; and
e. Include or address other matters prescribed by the regulations or specified by the SBCC.

Sections 73A(4) and 73A(5) direct that the BMAP must be consistent with the State Bushfire Management Plan, and such other plans, policies and strategies as may be prescribed by the regulations.

FES Act 2005 Section 127-Protection from liability provides protection to key stakeholders for information or actions undertaken in relation to BMAPs. In particular, *Section 127(4)* states:

(4) Without limiting subsection (1), no liability attaches to SACFS, the State Bushfire Coordination Committee, a bushfire management committee or a council (or the members of any of them) by virtue of the fact that a bushfire prevention plan—

(a) has not been prepared under this Act in relation to a particular part of this State; or

(b) has been so prepared but has not been implemented, or fully implemented.

Some examples may include the non-inclusion of an asset into a BMAP that is subsequently lost or damaged in a bushfire, or the inability of asset owners to undertake treatments assigned to assets.

1.3.2 Local Government Act

Section 7 of the Local Government Act 1999 specifies the principle functions of a council. The functions that are specific to this plan include:

- *Section 7(d):* to take measures to protect its area from natural and other hazards and to mitigate the effect of such; and
- *Section 7(f):* to provide infrastructure for its community and for development within its area (including infrastructure that helps to protect any part of the local or broader community from any hazard or other event, or that assists in the management of any area).

Additionally *Section 8(d) of the Local Government Act 1999* outlines the way in which councils are required to undertake their roles and functions. It specifies the need for consistency of all plans, policies and strategies with Regional, State and National objectives and strategies concerning the economic, social physical and environmental development and management of the community.

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1.3.3 State Emergency Management Act

Section 3 of the Emergency Management Act 2004 (South Australia) specifies that an "emergency means an event (whether occurring in the State, outside the State or in and outside the State) that causes, or threatens to cause:

a. The death of, or injury of, or other damage to the health of any person; or
b. the destruction of, or damage to, any property; or
c. a disruption to essential services or to services usually enjoyed by the community; or
d. harm to the environment, or to flora or fauna.

This is not limited to naturally occurring events (such as earthquakes, floods or storms) but would, for example, include fires, explosions, accidents, epidemics, sieges, riots, acts of terrorism or other hostilities directed by an enemy against Australia."

At a regional level, this plan will provide valuable input into the Zone Emergency Management Plan (ZEMP) in relation to rural fire.

1.3.4 Acts, Codes and Regulations Influencing Bushfire Management Planning

The following are some of the Acts, Codes and Regulations to be considered in developing and undertaking bushfire management planning and practices:

- *Native Vegetation Act 1991 (SA) Section 27 to 29*
- *Native Vegetation Regulations 2003 (SA) Section 5A-1 and 5(1)(zi)*
- *Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth) Section 14, 18 and 269AA*
- *Code of Practice for fire management on Public Land in South Australia 2012-2016*
- *National Parks and Wildlife Act 1972 (SA)*
- *Wilderness Protection Act 1992 (SA)*
- *Aboriginal Heritage Act 1988*
- *Crown Land Management Act 2009 (SA)*
- Planning Related Acts;
  - *Development Act 1993* Development Regulations 2008*
  - *Transition from DA1993 to PD&IA2016 (July 2016 to June 2021)*
  - *Planning, Development and Infrastructure Act 2016.*

The implementation of identified risk treatment strategies within this BMAP must comply with the requirements as directed by the above legislation. For example, *Sections 27 to 29 of the Native Vegetation Act 1991* outlines the approvals and circumstances required for the clearance of native vegetation. *The Environment Protection & Biodiversity Conservation Act 1999 section 18* outlines regulation of actions likely to impact nationally-listed species and ecological communities. Therefore any risk treatment actions in this BMAP that may require the clearing of native vegetation or impacts nationally-listed species are still required to comply with these Acts.

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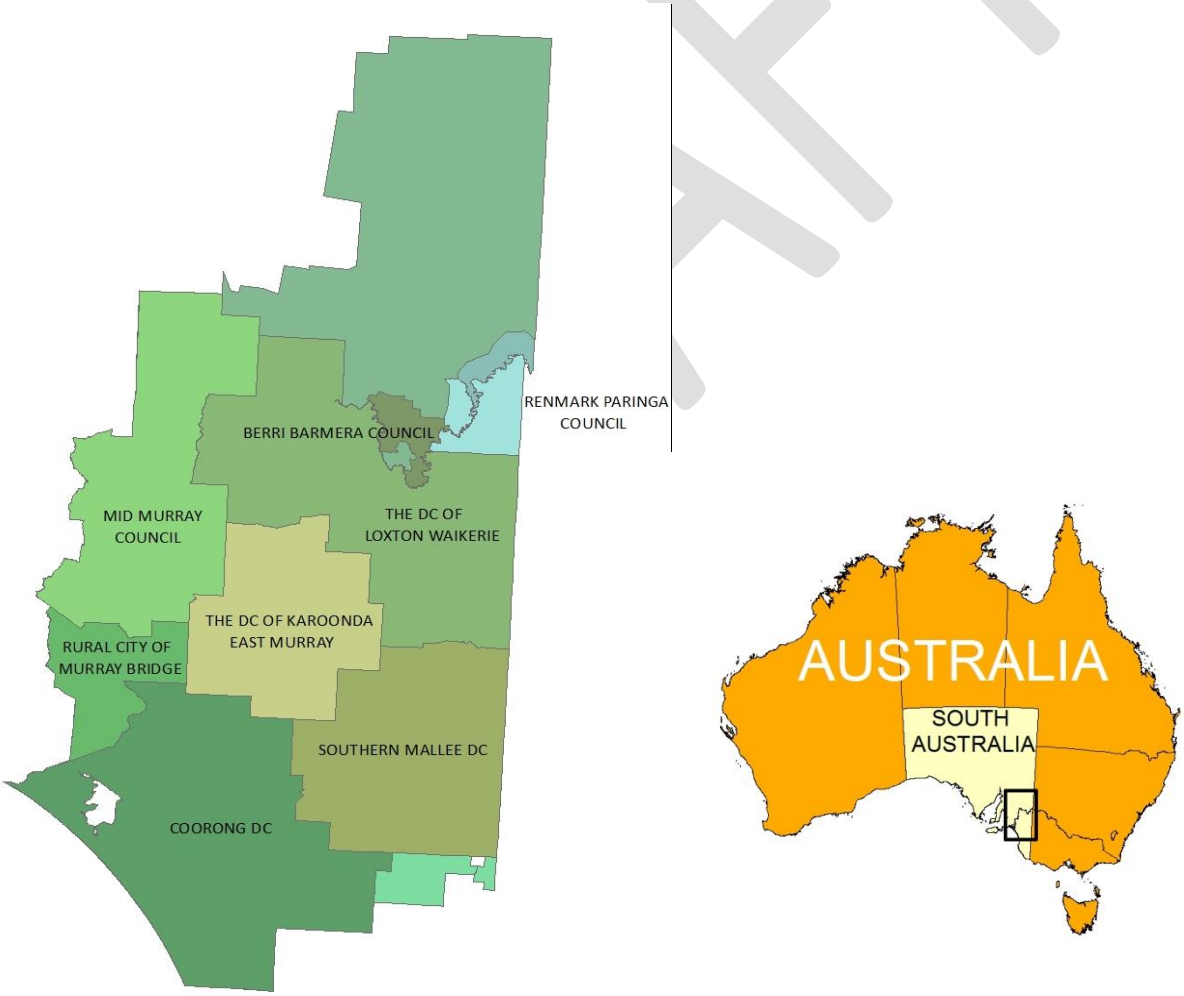
2 MURRAY MALLEE BUSHFIRE MANAGEMENT AREA

2.1 Location

The MURRM BMAP has been developed for the MURRM BMA region of South Australia. The boundary incorporates the whole of the following council areas: (see map below)

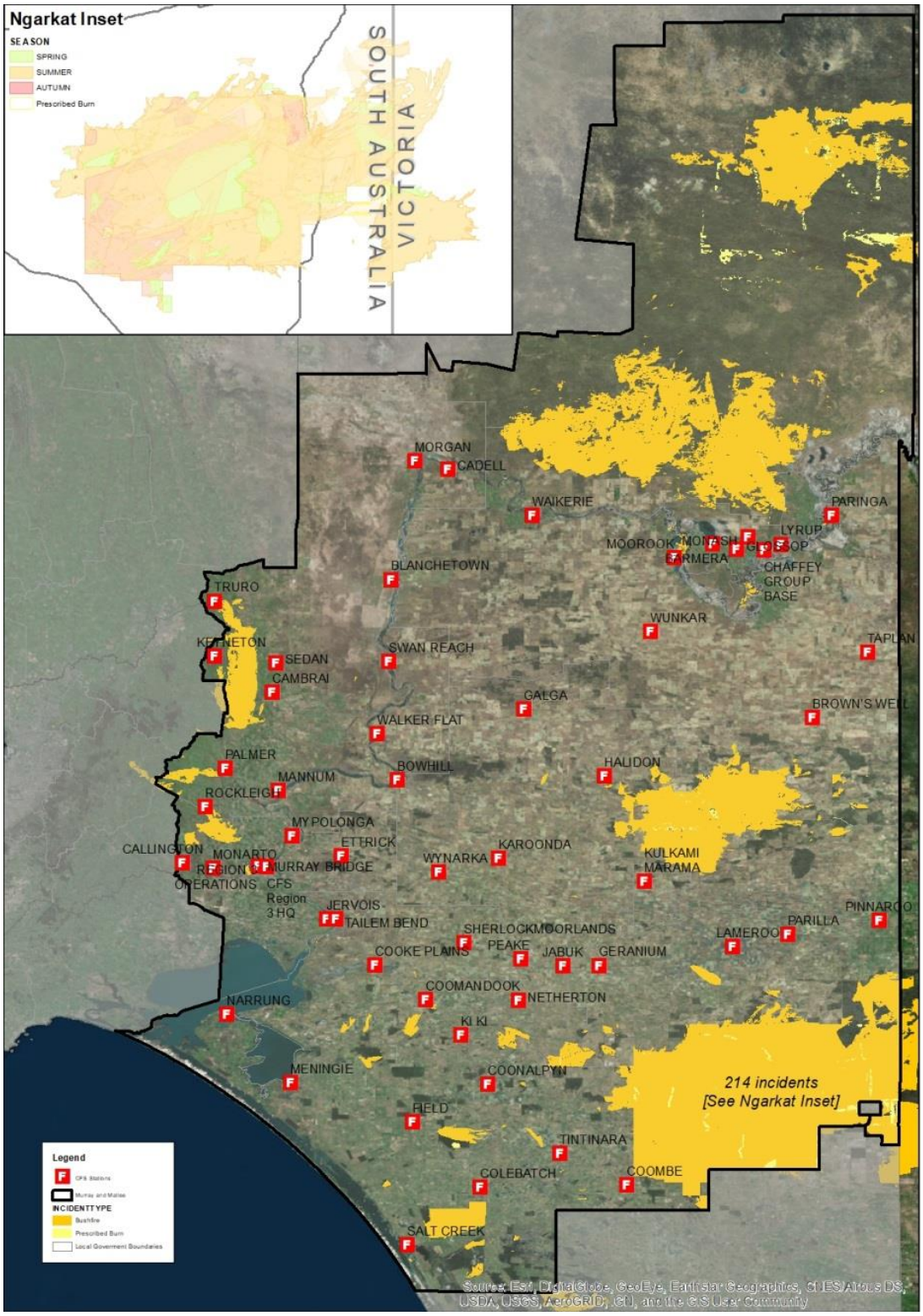
- Berri Barmera Council
- Coorong District Council
- District Council of Karoonda East Murray
- District Council of Loxton Waikerie
- Mid Murray Council
- Rural City of Murray Bridge
- Renmark Paringa Council
- Southern Mallee District Council



Map 1: Murray Mallee Bushfire Management Area

2.2 Fire History

Fire history has been considered as part of the risk assessment process. The map below illustrates the fire scars from 1950 to the present for the Murray Mallee, including prescribed burns.



Map 2: Murray Mallee Fire History

The following list contains examples of the years, the locations and data of some fires relevant to the MURRM BMA. It is not a definitive list of all fire occurrences within the BMA but provides a guide on the frequency of fires.

Fire history has been considered as part of the risk assessment process.

1999 Ngarkat Fire, 50,000ha land burnt

Ngarkat Fire, 110,000ha land burnt

1989 Messant Conservation Park Fire 2854ha land burnt

2001 Ngarkat Fire, 6000ha land burnt

2002 Messant Conservation Park Fire 3051ha land burnt

Billiat Conservation Park Fire 1157ha land burnt

2009 Tungkillo Fire

2013 Rockleigh Fire Autumn 1548ha land burnt

Rockleigh Fire Summer 1011ha land burnt

2014 Eden Valley Fire, 23647ha land burnt

Rockleigh Fire, 4216ha land burnt

Ngarkat Fire, 85890ha land burnt

Billiatt Fire (Riverland Complex Fires), Majority of Billiatt Conservation Park, 70155ha land burnt

Korah Bore, 629ha land burnt

Katrapako Island 797ha land burnt

Calperum 48076ha land burnt

2.3 Topography

Land within the Southern Mallee area is generally flat. Sand dunes become more prevalent south of the Mallee Highway, particularly within the Ngarkat Conservation Park. Land within the Karoonda East Murray area is generally undulating.

In the Mid Murray area the western edge and boundary forms a part of the Mount Lofty Ranges, however, much of this land is cleared grazing land. The plains area is mostly divided by the River Murray that flows for a distance of 220km through the District. This land is generally undulating apart from some Heritage Scrub and National Park areas.

The Loxton Waikerie area is generally undulating with land cleared to about 95% of the natural vegetation.

The Berri Barmera area is relatively flat with the Murray River and Lake Bonney forming the major geographical landmarks.

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The Renmark Paringa area is relatively flat with the main geographic feature being the river valley that meanders from the north-east to the south-west with the Murray River forming a large section of the Council boundary.

The Murray Bridge area is generally undulating although areas of high rolling hills exist on the western boundary. The River Murray dissects the District from north to south. To the east of Murray Bridge the land is generally flat to undulating.

The Coorong area ranges from very low lying areas just above sea level, to sand ridges, limestone and occasional granite outcrops throughout much of the grazing district. Coastal scrub and large tracts of clay soils accompany undulating sand dunes to the south of Meningie. The Young Husband Peninsula is almost all sand hills and coastal scrub. There are large areas of land affected by rising salt between the Dukes Highway and the Coorong.

2.4 River Murray and Murray Darling Basin

The River Murray is central to communities along the river, and has been for many thousands of years.

Aboriginal people, such as the Ngarrindjeri and First Peoples of the River Murray and Mallee region, have a strong spiritual and cultural connection to the land and waters of the river and are the Traditional Owners.

The river played a significant role in the settlement of South Australia and has a rich history as an important trade route and supporting the development of irrigation communities.

There are three distinct areas along the river with their own communities, industries and special attractions to visit, including world class environments with rare plants and animals, which are popular locations for birdwatching, hiking and canoeing:

- Riverland: from the border to Blanchetown, the region is known for its quality food and wine, Internationally important wetlands and national parks
- SA Mid-Murray: includes a number of large towns including Murray Bridge and Mannum, with easy access to Adelaide it is popular with shack owners and for boating and fishing
- Coorong, Lower Lakes and Murray Mouth: these internationally important wetlands are home to rare native plants and wildlife and an important site for migratory birds coming from as far as Siberia to breed.

The River Murray, Coorong, Lower Lakes and Murray Mouth are located at the end of the Murray-Darling river system which flows through Queensland, New South Wales, Victoria and ACT. As a result, communities, industries and the environment suffered greatly during the Millennium Drought.

Many projects are underway along the length of the river to maintain and improve the health of the river, wetlands and floodplains as well as support the communities and industries that rely on its water.

South Australia works with other Basin states, as well as the Australian Government and Murray-Darling Basin Authority, to share the water and manage the river through a series of locks, weirs, barrages and storages to deliver water when and where it is needed. Nationally, South Australia is also working together to deliver the Basin Plan, which, will guide the sustainable management of water across the entire Murray-Darling Basin.

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2.5 Land Tenure

The following list outlines some of the main types of land tenure in the MURRM BMAP:

- Private ownership – residential and industrial/commercial and conservation including *Vegetation Heritage Agreements under the Native Vegetation Act 1991.*
- Council managed areas
- SA Water lands and catchments
- Department of Environment, Water and Natural Resources (DEWNR) lands, parks and reserves
- Commonwealth and State Crown lands
- Aboriginal managed lands
- Pastoral Leases
- Mining Licenses

2.6 Land Use

The following list outlines some of the main types of land uses in the MURRM BMAP:

- Agriculture
- Viticulture
- Pastoralism
- Mining
- Conservation
- Tourism
- Industrial
- Residential
- Wind Farms

The type of land use may influence a range of bushfire issues such as chances of ignitions, ability of bushfire to establish and spread, opportunities for suppression and the risk treatments applied to reduce bushfire risk and impact. Although there are multiple land uses and land owners across MURRM, broader bushfire issues and risk treatments are assessed and applied using a tenure blind approach to bushfire management planning.

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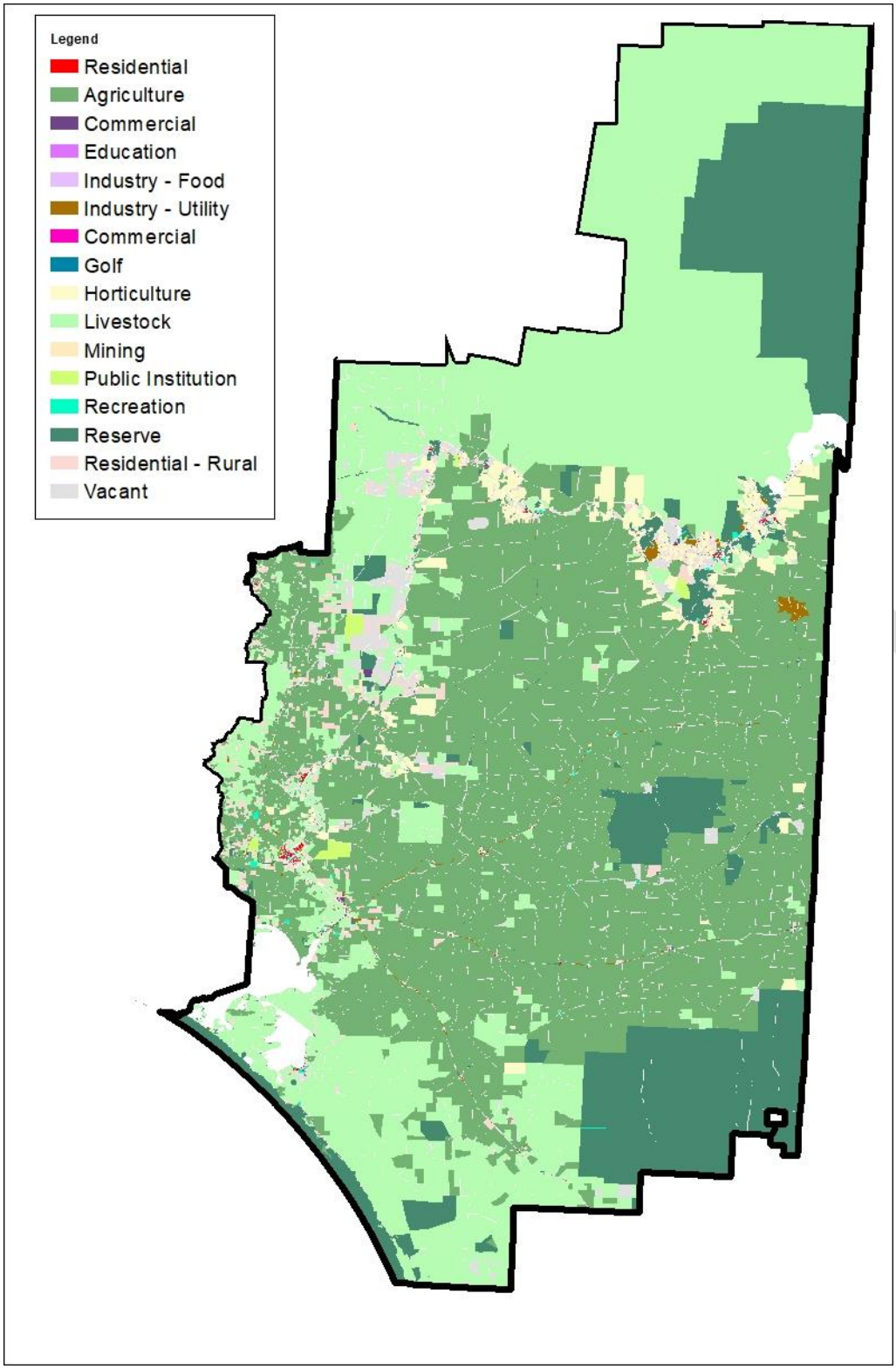

Map 3: Murray Mallee Land Use

2.7 Climate

2.7.1 Temperature

The temperature is typically Mediterranean in the coastal areas and semi-arid in other parts of the MURRM. This means hot dry summers and wet mild winters are experienced. In summer the maximum temperature ranges between 24 - 35°C, although on extreme days the temperature can reach >40°C. The average winter maximums range between 16 - 18°C and the winter minimums tend to fall between 5 - 8°C.

In the Coorong area milder temperatures often occur along coastal areas depending on weather patterns and wind directions.

2.7.2 Wind and Weather Patterns

The prevailing winds range from a south westerly to a north westerly direction. During summer the most frequent winds generally come from the southwest, however, on a significant number of days north-east to north-west winds can be experienced. On average strong winds in excess of 40km/h are experienced on about 5 days per month during spring and early summer lessening to 2 – 3 days per month during late summer. In the Coorong area the prevailing winds in the southern parts range from southerly winds off the southern ocean freshening and moving to the southwest in the afternoon.

2.7.3 Rainfall

Throughout the MURRM BMA the rainfall varies dependant on the season and the majority of rain falls between April to October with some heavier falls being recorded for some parts during January and February.

In the Mallee area the lowest recorded rainfall is in the northwest at Galga with an average of 276mm per year. The highest recorded rainfall is at Geranium on the western border of the Southern Mallee area with 401mm per year.

The Mid Murray area lowest recorded rainfall is in the north, in the Burra Creek Plains (north of Morgan) with an average of 230mm per year. The highest recorded rainfall is in the Tepko and Tungkillo areas, located within the Mount Lofty Ranges, with an average rainfall of 450mm per year.

In the Loxton Waikerie area the average annual rainfall varies from 300mm in the south to 250mm in the north along Goyder's Line. Similarly, the Berri Barmera area experiences an average annual rainfall of around 248mm and the Renmark Paringa area an average annual rainfall of 269mm.

The rainfall for the Murray Bridge area over 2009-2010 was 400mm and in the Coorong region there is substantially higher rainfall occurring in areas closer to the southern ocean with the average rainfall ranging between 380 – 500mm over the area.

2.7.4 The Impacts of Climate Change

Climate change is having direct environmental impacts on water resources, primary production, infrastructure, flora, fauna and the health of our landscapes. Climate change factors are also contributing to increases in bushfire frequency and intensity resulting from:

- Longer fire seasons
- Less opportunities for hazard reduction burns
- Record hot and dry conditions

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- More extreme and catastrophic fire danger days
- Severe weather events (dry lighting thunderstorms, sudden wind shifts)
- Reduced soil moisture
- Increase evaporation
- More demand for decreasing stocks of water

Additional information on climate change impacts can be found in the following websites:

Bureau of Meteorology: Climate Change and Variability
Climate Change in Australia

2.8 Fire Ban District and Bushfire Season

The MURRM BMA encompasses the Murraylands, Riverland, North East Pastoral and Upper South East Fire Ban Districts (FBD). Fire Danger Season (FDS) dates are set annually by the CFS Chief Officer based on recommendations from the MURRM BMC.

2.9 Population

The overall population for the MURRM BMA was estimated at 67,000 in 2006. Murray Bridge has the largest population due to its proximity to Adelaide followed by Renmark, Berri, Loxton, Barmera, Waikerie and Mannum. The townships of Meningie, Lameroo and Pinnaroo have smaller populations. Seasonally, most populations will fluctuate due to transient tourists and agricultural workers.

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3 ROLES AND RESPONSIBILITIES

3.1 State Bushfire Coordinating Committee

The *FES Act 2005 Section 71A* outlines the functions of the State Bushfire Coordination Committee. Some of these functions include:

a. promoting the State-wide coordination and integration of policies, practices and strategies relating to bushfire management activities;
b. providing guidance, direction and advice to bushfire management committees;
c. preparing and reviewing the State Bushfire Management Plan and to keep under review the extent to which Bushfire Management Area Plans and strategies adopted or applied by bushfire management committees are consistent with the State Bushfire Management Plan;
d. approving and auditing Bushfire Management Area Plans prepared and endorsed by Bushfire Management Committees.

3.2 Murray Mallee Bushfire Management Committee

The MURRM BMC has been established by the SBCC under the *FES Act 2005*, and under *Section 73A(1)* of this Act must prepare and maintain a BMAP for its BMA. This plan takes an unbiased landscape view of the strategic bushfire management needs of the BMA and is, therefore, boundary and tenure blind.

The key function of the MURRM BMC is to coordinate all relevant stakeholders with a responsibility for bushfire management within the BMA, to undertake a risk assessment process, and oversee the implementation of risk mitigation strategies. The purpose of this process is to reduce the risk of fire negatively impacting on life, property, and the environment in accordance with the *FES Act 2005*. The role and responsibility of MURRM BMC will include:

a. Promoting the coordination of policies, practices and strategies relating to bushfire management activities within its area;
b. Preparing and keeping under review a BMAP for its area and ensuring that the BMAP is consistent with the State Bushfire Management Plan;
c. Overseeing implementation of its BMAP and reporting to the SBCC;
d. Initiating or preparing the development of plans, policies, practices or strategies to promote effective bushfire management within its area;
e. Convening with local or regional forums to discuss issues associated with bushfire management within its area, including working with local communities to promote and improve effective bushfire management;
f. In the exercising and performance of their powers and functions:
    i. Having due regard to the impact of their actions on the environment; and
    ii. Seeking to achieve a proper balance between bushfire prevention and proper land management in the country; and
g. Performing any other functions assigned by the Minister or the SBCC.

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3.3 Bushfire Management Committee Member Organisations

BMC member organisations are responsible for:

- Contributing to the decision-making of the Committee
- Preparing and implementing action or work plans to address relevant risk treatments or issues identified in the plan.
- Ensuring input into the planning process by their BMC representatives
- Providing information and make decisions on bushfire management planning issues within the area
- Reviewing the Bushfire Management Area Plan information and drafts and make amendments if required
- Determining methodologies for community and public consultation on key components of the BMAP
- Assessing and endorsing BMAP updates or changes.

Please refer to Appendix 1 for a list of the MURRM BMC member organisations.

3.4 Community

Bushfire prevention and preparedness is a shared responsibility of the State government, local councils and fire agencies, individuals, landholders and building managers (public and private), and the broader community. This BMAP assumes that all persons in the MURRM BMA are responsible for the mitigation of the bushfire risk for themselves, their neighbours and their community, and therefore need to understand and partake in bushfire prevention and preparedness. This is especially relevant to the protection of life and the property and environmental assets not specifically identified, mapped or risk rated within this BMAP.

In particular, legislation (*FES Act 2005*) states that owners of land must take reasonable steps:

1) to prevent or inhibit the outbreak of fire on the land; and
2) to prevent or inhibit the spread of fire through the land; and
3) to protect property on the land from fire; and
4) to minimise the threat to human life from a fire on the land

To ensure that the community is observing these bushfire prevention and management activities, Local Government Fire Prevention Officers within the MURRM BMA are required by the *FES Act 2005* to assess the extent of bushfire hazards within the council area, and provide advice to land holders and work with communities on bushfire prevention and preparedness. Where necessary, Fire Prevention Officers can enforce the provisions of the *FES Act 2005* on private land.

While measures in this plan will assist to protect life and property, the work of agencies and authorities relating to fire prevention is only one aspect of limiting the impact of bushfire on the community. Property preparation and the public knowing how to stay safe during a bushfire are a vital aspect in preventing loss of life and property. The CFS "Prepare to Stay or Go" information package is an excellent guide for property owners concerned about bushfires. Information relevant to all members of the community on bushfire prevention and preparedness can be found on the following link: SA CFS Fact Sheets

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Visitor safety in National Park Reserves is a major consideration during the fire danger season and during bushfire suppression. Parks and Reserves may be closed temporarily due to forecast significant fire danger weather or during bushfires or other fire management related activities. Due to geographical expanse and remoteness, physical closures to all access points may not be possible. The public need to be educated to the fact parks and reserves may not be safe places during significant fire danger weather or during bushfires and the onus is on individuals to stay informed by monitoring forecasts, local radios stations or the CFS website or bushfire hotline.

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4 RISK ASSESSMENT

Risk assessment is undertaken as assets are identified for inclusion into the online mapping and Risk Register. The risk assessment process can be applied to cover the risks to structures, property and life within built assets. A process for determining risk outcomes for environmental assets is being developed and will be used to include environmental assets in subsequent updates of the MURRM BMAP.

The risk rating outcomes for assets currently identified in this Plan are determined using a number of inputs (risk drivers). Some of these include:

- Susceptibility of assets and people
- Vegetation type and its distance from the asset
- Predominant slope of the vegetation in relation to the asset
- Access and/or egress to and from the asset
- Frequency of ignitions in the general area of the asset

Risk drivers for each asset are contained in the extended version of the asset spreadsheet which is available from the CFS Bushfire Management Planning Unit.

4.1 Assets at Risk from Bushfire

The range of assets identified and assessed for their risk from bushfire in this BMAP has been sourced from local councils, infrastructure agencies, business groups, SA Government agencies, MURRM BMC working groups, CFS, community groups and web based geospatial resources.

The life and property assets are geographically identified and presented with a coloured risk rating as either, a point, line or polygon in the *online bushfire risk map* that forms part of this plan. This plan also includes a table listing all relevant information relating to the risks, as well as existing and proposed risk treatment strategies associated with each asset. The planning process allows for a single repository for all current and future assessments to be managed and maintained within the MURRM BMA.

The assets considered within this current plan are divided into four classes: Human Settlement, Economic Assets, Cultural Heritage and Environmental Assets. Environmental assets will be added to the plan at a later date *(Refer to Section 1.2.1: Constraints, Assumptions and Exclusions).* Each of these asset classes are further broken down into asset categories as shown in **Table 1.**

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Asset Class	Asset Category
Human Settlement	• *Residential* • *Special Fire Protection* • *Other*
Economic Assets	• *Infrastructure* • *Commercial or Industrial*
Cultural Heritage	• *Community* • *Historic* • *Other*
Environmental Assets	• *Flora* • *Fauna* • *Ecological communities* *(Refer to Section 4.2.4: Environment)*

Table 1: Asset Classes and Categories included in the Bushfire Management Area Plan

4.1.1 Human Settlement

Human Settlement assets are those assets which are likely to be occupied by people and may be at risk from bushfire. Therefore, there is the potential for the loss of human life.

4.1.2 Economic Assets

Economic assets considered within this plan are those of significance to the economy at all scales, and are at risk from the impact of bushfire. They include commercial and industrial sites, and infrastructure providing utilities such as energy, water, transport and telecommunications.

4.1.3 Cultural Heritage

Cultural heritage assets identified in this plan include those of significant cultural value, post 1836, when non-Aboriginal people moved in to the Region. This category will also include assets that are of local community value including halls, churches, institutes and recreational facilities. *Refer to Section 1.2.1: Constraints, Assumptions and Exclusions* regarding assets of Aboriginal cultural and spiritual significance.

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4.1.4 Environmental Assets

At the time of preparing this plan, a risk assessment process and related treatment management strategies for environmental assets is still being undertaken by major stakeholders. *(Refer to Section 1.2.1: Constraints, Assumptions and Exclusions, and Section 4.2.4: Environment).* The environmental assets to be considered for inclusion include flora, fauna, and ecological communities. Priority of assessment will be given to those species and communities that have been given a rating in line with the *Environmental Protection and Biodiversity Conservation Act 1999 (Commonwealth),* the *National Parks and Wildlife Act 1972*, or have been identified in the (Gillam, S. and Urban, R. (2010) Regional Species Conservation Assessment Project Phase 1 Report: Regional Species Status Assessments, Murraylands Region Department of Environment and Natural Resources, South Australia*).* No risk mitigation treatment should be undertaken in native vegetation until these environmental assets have been identified through an environmental risk assessment process.

4.1.5 Assets and Areas not risk rated

Land, assets, communities or people who are not specifically identified or mapped within this BMAP may still have a level of bushfire risk. This is particularly relevant to the more sparsely populated areas outside of rural townships. Landholders in the MURRM BMA, including people and asset owners not risk rated, have a responsibility to undertake bushfire prevention and preparedness activities relevant to their location and situation.

4.1.6 Bushfire Safer Places and Last Resort Refuges

The terminology and separate categories previously referred to as the Bushfire Safer Settlement and Bushfire Safer Precincts have now been consolidated to a single category of Bushfire Safer Places. The terminology and category of Last Resort Refuge has remained unchanged.

The BMAP process may identify changes to Bushfire Safer Places and Last Resort Refuges such as an expansion of a township. This may result in the BMC requesting a reassessment based on these changes.

4.2 Bushfire Risk Assessment

The risk assessment framework utilised in the development of a BMAP analyses a range of inputs to determine the potential likelihood of a bushfire igniting, establishing and spreading to assets, and the potential consequence (impact) to those assets. Combining the likelihood with the consequence provides the overall risk rating for an asset or area. *(Refer to Section 4.2.5: Risk Ratings).*

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Figure 1: Bushfire Risk Diagram

4.2.1 Weather Context

When the bushfire risk assessment was undertaken for this plan, the weather conditions taken into consideration were BOM weather data over the fire danger season period for the last 5-7 years for each Fire Ban District.

The required weather input for the risk assessment process includes:

- Air temperature (°C)
- Relative humidity (%)
- Wind speed (Km/h) at a height of 10 metres
- Drought factor (BOM)
- Soil Dryness Index (SDI)

The weather context assumes a fire danger rating (FDR) of Extreme, typically characterised by fully cured fuels, high temperatures, low relative humidity, high winds and a total fire ban day.

Through their local knowledge of fire weather and fire behaviour, workshop attendees and other stakeholders are able to determine which assets would be at risk and aid in the determination of likelihood and impact of bushfire.

4.2.2 Likelihood

In determining the likelihood of a bushfire igniting and spreading and impacting an asset the following inputs are considered:

- Australian Incident Reporting System (AIRS) data from SACFS for known ignitions to gain an understanding of fires that have occurred.
- Current land use data across the State to assist in determining vegetation layers and activities associated with land use that could be potential ignition sources.
- Historical evidence of past bushfires and scarring across the landscape.
- The type of vegetation within the landscape.

Inputs include Bureau of Meteorology data relating to local weather conditions within the MURRM BMA, vegetation classification and fuel structures to undertake basic fire behaviour modelling. Local knowledge is also used to validate the system-derived likelihood calculations.

4.2.3 Consequence

The term "consequence" for the purpose of this plan applies only to the asset itself. It means "what will happen to the asset if it is impacted by a bushfire?" For example will it burn down, will it cease to function, will people be injured etc.? It does not refer to the wider level social, financial or business continuity consequences of losing the asset. These wider level consequences are to be considered following direction from the State Bushfire Management Planning process which is reviewing major risks to the state using the *National Emergency Risk Assessment Guidelines (NERAG*). Related actions and treatments will be considered in the implementation phase of the Bushfire Management Action Plans.

The elements that contribute to the consequence of a bushfire on an asset are the *Bushfire Attack Level (BAL)* measuring the radiant heat) and either the *susceptibility of occupants in human settlement assets or susceptibility of built structures.*

Bushfire Attack Level (Radiant Heat)

Bushfire Attack Level (BAL) is a measure of the radiant heat a building or structure is expected to be subjected to in the event of a bushfire on a day of Extreme FDR. This measure is used by the *AS3959 Australian Standard* for the construction of buildings in bushfire-prone areas in that buildings are rated to certain BALs.

The BAL is determined by classifying the type of vegetation around the building, the distance of the vegetation from the building, the slope of the land around the vicinity of the building. The higher the BAL, the higher the radiant heat will be at that site during a bushfire. The aim should be to maintain assets below a BAL of 12.5 Kw/m^2 thereby eliminating the ignition of the structure from radiant heat. It should be noted that this Standard does not take into account the potential impact of spark and ember on structures.

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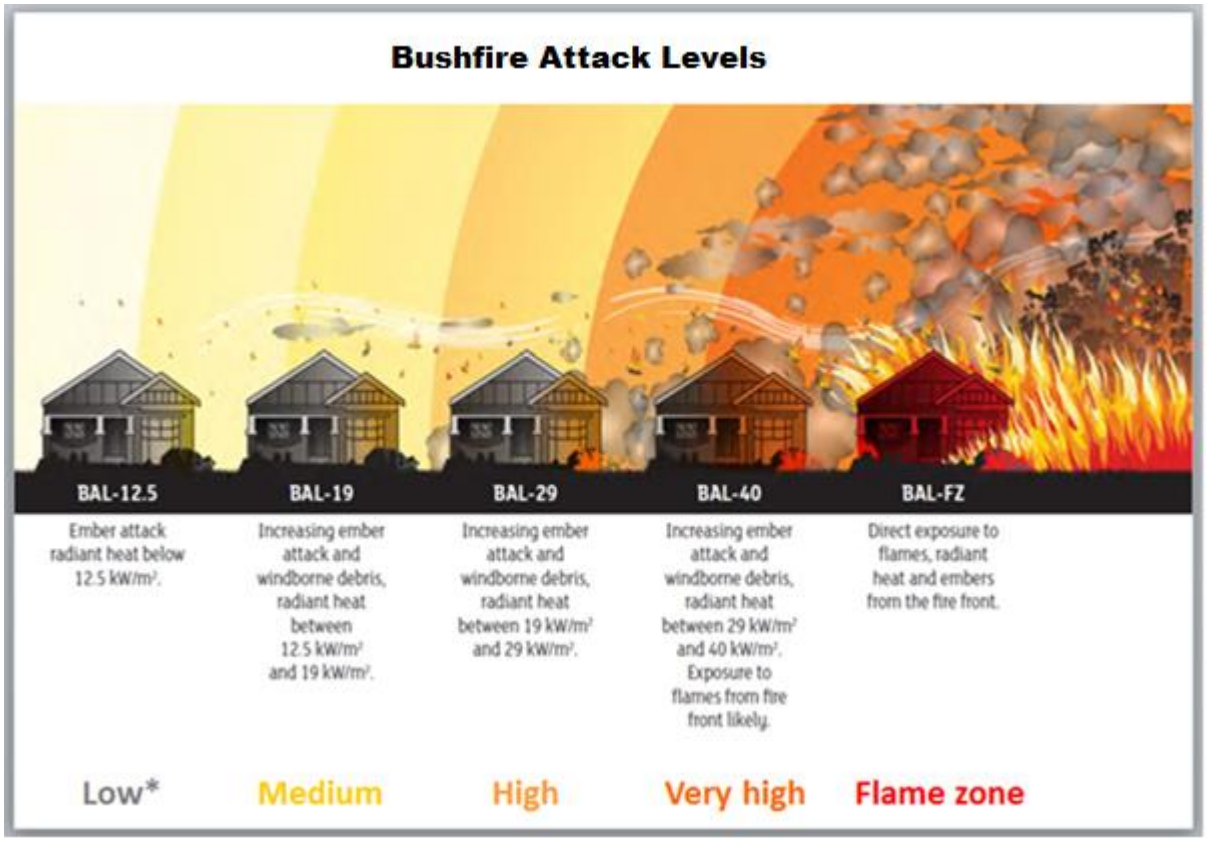

Figure 2: Bushfire Attack Levels

Susceptibility of Human Settlement Assets

This assessment refers to the susceptibility of the building occupants to bushfire and therefore, the potential for the loss of human life. It is not the assessment of the structures or the built environment.

This assessment is based on the combination of three elements: the people who live in the area, the preparedness level of the assets and environmental factors. For example, a rural community with a very active Community Fire Safe Group, well prepared properties and a well maintained bushfire buffer zone will have a reduced susceptibility.

Susceptibility of Built Structures (Economic and Cultural Heritage Assets)

The susceptibility of a built structure being adversely impacted by bushfire is dependent on the type of construction and material used as well as its general condition. For example, concrete water tanks or steel towers have a very low susceptibility, whereas a heritage timber barn would have a very high susceptibility.

4.2.4 Environment

Environmental assets are located throughout the BMA, occurring on private and public lands, including protected areas. The MURRM BMC and the SBCC acknowledge the importance of including environmental assets in bushfire risk management. However, a formal process for the risk assessment of environmental assets vulnerable to bushfire is not complete at the time of this plan's initial release. The assessment process and inclusion of environmental assets will occur in subsequent updates of this BMAP. Any identification and assessment of risk levels and risk treatment strategies for environmental assets must include a determination

of potential impacts on significant species and ecological communities. Prior to the addition of these assets and related information into the BMAP, a six week period of public consultation will be undertaken to enable input and comment from interested organisations, groups and individuals. *(Refer to Section 1.2.1: Constraints, Assumptions and Inclusions).* The process will include a review of property asset risk treatments that may have environmental impacts in order to minimise these impacts without compromising community safety.

Additionally, DEWNR Fire Management Plans provide strategic fire management direction for DEWNR-managed lands and some privately owned Vegetation Heritage Agreements where landholders agree to participate. These plans do not consider all tenure types, as required for BMAPs. DEWNR is currently developing a risk assessment process for environmental assets on both public and private land.

DEWNR's risk-based Fire Management Plans (*http://www.environment.sa.gov.au/managing-natural-resources*) include strategies for bushfire risk mitigation and suppression on DEWNR reserves and selected surrounding lands.

The recommendations made within this DEWNR fire management plan are supported by the MURRM BMC, and work is underway to incorporate this plan into the MURRM BMAP.

Whilst DEWNR Fire Management Plans provide strategic fire management direction for DEWNR-managed lands and certain privately owned *Vegetation Heritage Agreements*, they do not consider all tenure types, as required for BMAPs.

A risk assessment process which will include environmental assets on public and private land is currently being reviewed by the State Bushfire Coordination Committee and subject matter experts.

Environmental assets that may be considered in a subsequent risk assessment include:

- Large areas of native vegetation – these areas are important for biodiversity conservation (e.g. providing habitat), and may be made up of formally protected reserves, Crown lands, other lands managed by government agencies, roadside vegetation, private protected areas (Vegetation Heritage Agreement under the *Native Vegetation Act 1991),* and other private lands.
- Native species and ecological communities of conservation significance. 'Of conservation significance' is used to describe rated populations or species of flora and fauna as well as vegetation communities. These may be:
    a. Nationally rated, that is, listed as Threatened (with a rating of Extinct, Critically Endangered, Endangered or Vulnerable) under the federal Environment Protection and Biodiversity Conservation Act 1999.
    b. South Australian rated, listed as Threatened (with a rating of Endangered, Vulnerable or Rare) under the National Parks and Wildlife Act 1972, Schedules 7, 8 and 9.
    c. Provisionally listed as Threatened (with a rating of Endangered or Vulnerable) in South Australia, that is, included on the unpublished DEWNR Provisional List of Threatened Ecosystems of South Australia (Department of Environment and Heritage (DEH) 2005b).
- Significant habitat elements (e.g. tree hollows)
- Revegetation projects

Secondary risks to the environment (e.g. the environmental impacts caused by risk mitigation activities) will also be considered, including:

- Fire frequencies outside of Ecological Fire Management Guidelines
- Introduction of threats or conditions favourable to abundant or pest species (e.g. weeds, phytophthora, herbivores).

Further information for the management of natural resources in South Australia can be found on the DEWNR website. The following links to Managing Natural Resources and to Fire Management provide a range of information on stakeholders, responsibilities, strategies and actions in protecting and managing natural resources and managing fire:

- http://www.environment.sa.gov.au/managing-natural-resources
- http://www.environment.sa.gov.au/firemanagement/Home
- http://www.cfs.sa.gov.au/site/prepare_for_bushfire/native_vegetation_management.jsp

4.2.5 Risk Ratings

Table 2 below shows a standard risk rating matrix. It combines the likelihood and consequence scales previously described to assign a level to each risk in terms of Low, Medium, High, Very High or Extreme. For example, the likelihood of bushfire igniting and establishing in saltbush and sparse grassland is *Unlikely*, and if it did manage to spread to a concrete water tank, the consequence to the water tank would be *Minor.* This would result in a risk rating of *Low* ***(Refer to Table 2 below: Overall Risk Rating Matrix)***. However a bushfire igniting and spreading in woodland is *Likely* and if it spread to an adjacent caravan park the consequence to the caravans and the people would be *Catastrophic.* This would result in a risk rating of *Extreme.* These risk ratings can be used as a guide in determining the level of urgency for allocating and implementing risk treatment strategies. Although this method is very common, it is limited by only representing two dimensions of the risk; the likelihood and consequence. Considerations also need to be given to the type of asset being impacted by a bushfire, the level of risk that may be considered acceptable and whether a desired risk level can be maintained or is achievable through current or proposed mitigation strategies. For example, a nursing home rated high may be a much higher priority for risk treatments than a communication tower rated as extreme.

		Consequence			
		Minor	Moderate	Major	Catastrophic
Likelihood	Almost Certain				
	Likely				
	Possible				
	Unlikely				

Low Medium High Very High Extreme

Table 2: Overall Risk Rating Matrix

Assets at almost no risk from bushfire may be marked as: **N/A**

Risk Rating Explanations

When interpreting the overall risk rating for each asset it is important to understand that these results provide a scale only by which one risk can compared to another. They are derived through assessing specific risk criteria to determine the likelihood of a bushfire threatening an asset and the level of impact or consequence to an asset from the hazardous vegetation should it be ignited by bushfire. The definition for each overall risk rating is as follows:

Negligible (N/A)

Properties and assets are constructed of materials that are unlikely to be impacted by bushfire and/or vegetation is at a significant distance away or virtually absent from the surrounding landscape.

Low

Properties and assets are well prepared or defendable from the potential impacts from a bushfire. Surrounding vegetation is either likely to be a significant distance away or of low levels.

Medium

Properties and assets are likely to be defendable with little preparation, although surrounding vegetation or topography still poses some risk.

High

Properties and assets that are not prepared for a bushfire or don't have adequate separation distance or firefighting amenities. Assets are susceptible to the impacts of bushfire as fire intensity and behaviour is driven by surrounding vegetation and topography.

Very High

Properties and assets require special consideration to the impacts of bushfire. Bushfires are likely to be able to reach assets with high intensity with only low expectations of being able to defend assets.

Extreme

Assets and properties are highly susceptible with heavy ember attack and likely flame contact from nearby flammable materials. There are limited options for safe egress or areas that offer sufficient access to defend a property from the effects of a bushfire due to continuous or dense vegetation or challenging topography.

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5 RISK TREATMENT STRATEGIES

Bushfires cannot be eliminated from the landscape; however a combination of risk treatment strategies can be applied to reduce either the likelihood and/or impact of bushfire and to increase community resilience, enhance the ability of firefighting agencies to access and suppress bushfires, limit the spread of bushfire, and protect people, assets and the environment.

Risk treatments are activities used to modify the characteristics of a hazard to reduce either the likelihood and/or consequence of bushfire on an asset. The MURRM BMC will allocate mitigating risk treatment strategies to reduce the risk to assets within the MURRM BMA. To facilitate this, the SBCC has endorsed risk treatment strategies that include both asset specific and BMA wide risk treatments.

For a full list of all risk treatments strategies please refer to *Section 5.3: Risk Treatment Strategies Suite.*

5.1 Asset Specific Risk Treatment Strategies

Asset specific risk treatment strategies are allocated to mitigate individual risks within the BMAP Risk Treatment Register and are designed to mitigate specific elements of the risk i.e. the radiant heat, susceptibility of the asset to sparks and embers, the intensity of the bushfire and/or the potential of a bushfire starting and establishing. Asset specific risk treatment strategies are allocated to asset owners and/or land managers that are responsible and will assist in documenting in their work plans, details of actions and timeframes.

Some examples of asset specific risk treatments include:

- Property preparedness by ember proofing and clearing debris around a building
- Asset Protection Zone (APZ) of modified vegetation in and around an electrical substation
- Bushfire Buffer Zone (BBZ) of modified vegetation in a nature park immediately adjacent to a nursing home
- Bushfire Prevention Activities such as collaboration between landholders, council fire prevention officers and other agencies regarding property preparedness.

For a copy of the list of specific risk treatments allocated to individual assets, please contact the CFS BMPU.

A new Standard was approved by the SBCC in early 2017 for creating and maintaining APZs, BBZs and Conservation Zones. For current information on APZs, BBZs and Conservation Zones please refer to the *Bushfire Management Zone Standard and Guidance for Use.*

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5.2 Bushfire Management Area Wide Risk Treatment Strategies

BMA wide risk treatments are the overarching bushfire prevention and preparedness activities that are applied to mitigate the occurrence, spread and consequence of bushfire to a number of assets, across selected areas, or throughout the whole BMA.

They broadly address the bushfire risk to assets and, thereby, reduce the overall level of bushfire risk in the BMA. Each of the risk treatment strategies will reduce either the likelihood and/or the consequence of bushfire depending on the targeted outcome of the programme.

BMA wide risk treatments may include legislative requirements, policies and programs of firefighting agencies, fuel hazard reduction, fire management planning, development and building regulations in fire prone areas, arson prevention programmes, and community engagement and education about bushfires.

Some examples include:

- National and State Legislation, Policies, Guidelines and Codes such as the *South Australian Fire and Emergency Services Act and Regulations 2005*, that includes applicable fuel management requirements, firebreak standards and annual enforcement programmes
- State and local planning frameworks such as the State Bushfire Management Plan, MURRM Bushfire Management Area Plan, local Council roadside vegetation management strategies
- DEWNR, SA Water and Forestry SA fire management policies and plans which sets out a range of mitigation strategies to minimise the impact of bushfire on built and environmental assets
- CFS state-wide preparedness campaigns, partnerships and community engagement programmes, and management of Fire Danger Seasons, Fire Danger Ratings, Permits and Total Fire Bans
- Department of Education and Childhood Development policies and procedures for schools at risk from bushfires
- Building Code of Australia and State based Minister's Specifications
- SA Police Operation Nomad

5.2.1 Landscape Risk Treatment and Investigation Areas

Landscape Treatment Investigation Areas have been identified as areas of strategic importance when suppressing bushfires, and require further assessment and consultation with stakeholders to determine the most effective, acceptable and achievable fuel management strategies to provide strategic opportunities across the landscape.

In order to comply with National and State requirements for the management of vegetation to reduce bushfire risk, and to reduce specific landscape risks within the MURRM area, the Bushfire Management Planning process has identified an initial number of "Landscape Treatment Investigation Areas" as examples of a fire management approach for bushfire mitigation at a broader landscape scale. Landscape risk treatments to manage vegetation may involve the use of prescribed burning, mechanical removal of vegetation or weed spraying depending on operational practicality, environmental factors and ecological impacts.

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The investigation areas that have been selected by the BMC aim to complement current public land management mitigation activities, linking areas of existing lower fuel hazard levels to enhance the effectiveness of these treatments. The areas to be treated may aim to enhance suppression capability and therefore reduce the risk of fire moving between large or distinct areas of high fuel. Landscape risk treatments also aim to reduce the risk of a bushfire impacting asset clusters such as townships or human settlement areas rather than individual residences.

The investigation areas identified in this plan do not represent a complete priority-based list of all potential landscape treatment investigation areas. Areas may be added, removed or amended following more detailed risk assessments and community consultation. It should be noted that following its initial approval and publication, the MURRM BMAP remains a live document that will be updated on a regular and ongoing basis. As such, there is still ongoing work in negotiating and prioritising treatments for current investigation areas and in identifying and prioritising additional areas and treatments to be included into the BMAP. Areas of Crown land and locations where vegetation management practices are already in place have also been identified within these areas as Existing Landscape Treatments.

Additional treatments may also be considered within and adjacent to these investigation areas such as community engagement or Operation Nomad activities.

All landscape risk treatment works are undertaken with consideration to all environmental and ecological issues and in accordance with required approvals such as the *Environment Protection and Biodiversity Conservation Act 1999*, and the *Native Vegetation Act 1991*.

5.3 Risk Treatment Strategies Suite

5.3.1 Property Preparedness

Property preparedness relates to action taken by landholders to reduce the risk of bushfire impacting on a house or other buildings. The primary focus of property preparedness should be the reduction of fuel hazards around the property and the elimination of ignition sources in areas surrounding or on structures, by:

- reducing or removing hazardous and fine vegetation fuels (long grass, dried leaves, shrubs etc.)
- removing other flammable materials and liquids
- reducing the risk of impact from windblown burning embers, flame contact and intense heat radiated from bushfires.

If the occupants plan to stay and defend their home during a bushfire, having a well prepared property is essential.

The following CFS webpage includes information and fact sheets on property preparedness and asset protection zones:

- *http://www.cfs.sa.gov.au/site/resources/fact_sheets.jsp*

5.3.2 Asset Protection Zones

An Asset Protection Zone (APZ) surrounds or is adjacent to an asset listed in the BMAP Risk Register.

APZs should be managed so that the Overall Fuel Hazard (as an average throughout the zone) does not exceed Moderate. Dry grass in an APZ should be maintained at 10cm or less.

APZs are designed to reduce fire spread, intensity, radiant heat and direct flame contact to an asset. The location of an APZ should include areas such as existing cleared areas, roads and driveways which have low fuel levels.

The *Native Vegetation Act (1991)* allows for the clearing of understorey for up to 20m around a residence for fire protection[1]. An APZ may be extended beyond 20m where slopes occur downhill from the asset where vegetation types have high fuel levels *(refer to AS3959 2011*[2]). An APZ may similarly be less than 20m where the ground slopes uphill from assets or where vegetation fuel levels are low.

An APZ may be used to reduce the risk of impacts to assets identified in the BMAP Risk Register, for example residential buildings, industrial, commercial or heritage buildings, essential infrastructure, and cultural or environmental assets or items).

A new Standard was approved by the SBCC in early 2017 for creating and maintaining APZs, BBZs and Conservation Zones. For current information on APZs, BBZs and Conservation Zones please refer to the *Bushfire Management Zone Standard and Guidance for Use.*

5.3.3 Bushfire Buffer Zones

A Bushfire Buffer Zone (BBZ) is an area, beyond an APZ, where additional fuel management can reduce the risk of bushfire impact on assets. These zones often complement an APZ around a significant asset.

BBZs may also be used to provide strategic fuel reduced areas, which may include fuel breaks through or around a large block of vegetation, with the aim of reducing:

- the impact of bushfire burning a whole large block of native vegetation or several adjacent smaller areas of native vegetation;
- the potential for a bushfire to burn out of vegetated land into surrounding land; or
- the potential for a bushfire to burn into vegetated land from surrounding land.

A new Standard was approved by the SBCC in early 2017 for creating and maintaining APZs, BBZs and Conservation Zones. For current information on APZs, BBZs and Conservation Zones please refer to the *Bushfire Management Zone Standard and Guidance for Use.*

5.3.4 Bushfire Prevention Activities Conducted by a Council Fire Prevention Officer

Councils and Fire Prevention Officers undertake fire prevention activities as outlined in the *South Australian Fire and Emergency Services Act 2005 (Part 4A Division 2)* and *Fire and Emergency Services Regulations 2005*. Bushfire prevention activities undertaken by Fire Prevention Officer include:

- assessing the extent of bushfire hazards within the relevant council area;

[1] See the brochure *Reduce the Impact of Bushfire for more detail.*

[2] AS3959-2009, amended 3-2011, Construction of buildings in bushfire-prone areas, Standards Australia.

- assisting the council in providing advice and information to any bushfire management committee whose area incorporates any part of the relevant council area in connection with the preparation or review of the committee's Bushfire Management Area Plan;
- providing advice to owners of property in respect of bushfire prevention and management;
- carrying out any other functions assigned to the Fire Prevention Officer by the regulations.

5.3.5 Community Engagement

Community education and engagement activities can extend from simple information provision to extended training and empowerment programmes. These activities can be, and are, undertaken by many different groups (CFS, MFS, local councils, SAPOL, Primary Producers SA, Red Cross, etc.). The type of programme or information that needs to be provided is dependent on the audience and their level or risk. Research has shown that information provision on its own, whilst important, does not lead to a sufficient level of planning and preparation for bushfires. Community engagement programmes have the potential to achieve positive outcomes at both the individual (resident, household, etc.) and community levels, provided they are planned, well implemented and resourced appropriately.

5.3.6 Firebreaks and Fire Access Tracks

Firebreaks and fire access tracks are strategic fire management works which may be implemented as measures to assist with bushfire mitigation or suppression. The standard for firebreaks and tracks has been defined in the *South Australian Firebreaks, Fire Access Tracks and Sign Standards Guidelines (2015 Government Agencies Fire Management Working Group GAFMWG)* and was endorsed by the SBCC.

A firebreak is an area or strip of land where vegetation has been removed or modified to reduce the intensity and rate of spread of fire that may occur. A fire access track is designed, constructed and maintained for the safe passage of firefighting vehicles undertaking fire suppression activities. Whilst firebreaks and fire tracks may be constructed or designed for a specific purpose, it does not necessarily exclude a fire track to also act as a fire break, or vice versa, in some instances. See the *GAFMWG Standard* document for further information on firebreaks, fire access tracks and sign standards.

5.3.7 Prescribed Burning

Prescribed burning is the controlled application of fire under specified environmental conditions to a predetermined area and at the time, intensity, and rate of spread required to attain planned resource management objectives. Prescribed burning is a tool used to achieve fuel hazard reduction management for bushfire risk mitigation and to achieve environmental, land management and research objectives.

The State Government public land agencies of DEWNR, SA Water and ForestrySA share agency resources to undertake fuel hazard reduction prescribed burning at a landscape scale across public lands to reduce the risk of bushfire impacts entering or emanating from a reserve.

Within the BMAP area and more broadly across the state only handful of prescribed burns are undertaken annually on private lands. The lack of prescribed burning on private lands is considered a significant gap in bushfire mitigation management as high bushfire risk areas occur on privately owned land and are not confined to public land. In an attempt to address this gap, DEWNR and SACFS are to identify issues associated with prescribed burning on private land and will present recommendations for consideration by Government to enhance prescribed burning mitigation risk treatment on a "tenure- blind" landscape scale.

Information on prescribed burns can be found on the following link: *DEWNR Prescribed Burns*

5.3.8 Council Planning and Development Policy and Standards

Key objectives outlined within planning strategy documents and Development Plans across Government and in local area Development Plans (as required under *Section 22 of the Development Act 1993*), should give consideration to the protection of life, property and assets including infrastructure, the region's cultural heritage (indigenous and non-indigenous) and environmental assets from hazards such as bushfire.

Ministers and or Local Government may amend such policies and strategies in order to accurately address key objectives relative to the risk identified in their local area.

Current planning policies relating to bushfire risk, contained in relevant Development Plans, may be reviewed in this context as part of future Development Plan amendments. Notably, the State Government has embarked on the implementation of key planning reforms over the next 1-5 years, as part of a new planning system and the *Planning, Development and Infrastructure Act, 2016.* Pending the timing and sequencing of the introduction of new planning rules and governance systems, there is potential to also review future policy approaches relating to bushfire risk and asset protection through this process.

5.3.9 Policy, Standards and Codes of Practice

The policies, standards and codes of practice refer to current overarching bushfire management practices, performance measures and desired outcomes of the fire management activities on private and public lands. They provide a framework for the safe and effective management of potential ignition sources and fire on private and public land in South Australia. Examples include codes on Pile Burning, Harvesting and Use of Wood Ovens, and policies requiring permits for fire activities.

This strategy may also include emergency management policies that individual organisations such as schools, health and community services and utilities have or require to mitigate bushfire risk to their assets. Examples may include closing assets or not driving through high risk areas on catastrophic fire danger forecasts.

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5.4 Risk Treatment Implementation Plan

Once the MURRM BMAP has been approved by the SBCC, risk treatment implementation plans will be developed in conjunction with the BMC, Councils, asset and land manager/owners in order to document and report how the chosen risk treatment strategies and their associated activities will be implemented. These plans may include information such as:

- Risk and risk treatment identifiers
- Existing and proposed risk treatments
- Responsibility for risk treatment implementation
- Prioritisations of risk treatments
- Timeframes for the completion of risk treatments
- Reporting and monitoring procedures

The risk treatment implementation plan will enable councils and land managers to develop or inform local works plans and will provide a mechanism for the MURRM BMC to monitor timeframes and progress of risk treatments.

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6 REVIEWING, MONITORING AND REPORTING

6.1 Monitoring

The SBCC approves new or amended BMAPs and provides guidance, direction and advice to bushfire management committees.

The MURRM BMC is required to monitor all aspects of the BMAP contents, risk assessments and risk treatments on an ongoing basis including:

- Changes to accepted risk levels
- Changes in circumstances or assessment criteria
- Additional information (should it become/when it becomes available)
- Changes in social, political or legislative/regulative environments
- Changes to the BMC area or organisational responsibilities
- Progress toward the completion of the risk treatment works listed in the BMAP
- The timeliness of the risk treatment works in the BMAP
- Compliance of risk treatment works with relevant Acts, Codes and Regulations. *(Refer to Section 1.3: Legislation)*

6.2 Reviewing

As stipulated in the *FES Act 2005* this BMAP must be formally reviewed at least once in every four year period from the approval date of the original plan.

However, as a live Plan, the MURRM BMC will ensure that the BMAP is reviewed, in part or wholly, whenever an amendment, context or risk issue is identified or brought to the attention of the BMC, or to assess the progress of risk treatment works against stated timeframes. A summary of actions and amendments will be reported by BMCs to the SBCC on at least an annual basis.

6.3 Reporting

The MURRM BMC is required to report to the SBCC on its progress implementing the bushfire risk management strategies identified in the plan. BMC member organisations will need to report to the MURRM BMC on the progress of risk treatment works outlined in the BMAP. The BMPU will submit BMAP amendments, additions and deletions to the BMC for assessment and endorsement. The implementation of BMAP actions and reporting processes for the BMC is currently being developed.

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7 REGISTERS

7.1 Overview of Risk and Risk Treatment Registers

The Risk Register and Risk Treatment Register are integral components of this BMAP, along with the online map and this context document. They are current as of the date this document was approved. Due to the dynamic nature of risk, the BMC will monitor and update the status of risks and risk treatments once the risk treatment works have been completed, or where there is a change in the factors that determine the level of risk. The information pertaining to each risk is to be monitored by the BMC and updated and maintained by the CFS Bushfire Management Planning Unit on the secure Bushfire Risk Information Management System (BRIMS).

7.2 Risk Register

The Risk Register lists the description and location of all assets identified within the MURRM BMC and the overall resulting risk rating that has been determined for each asset. The level of risk for each asset in the risk register does not necessarily indicate its level of priority for mitigation works. For example, a nursing home rated high may be a much higher priority for risk treatments than a communication tower rated as extreme. The BMC and member organisations will identify, monitor and report on priorities for mitigation works.

7.3 Asset Specific Risk Treatment Strategies Register

The Risk Treatment Register details the risk treatment strategies that have been allocated to each asset. The register also includes planned timelines for when the risk treatment strategies are to be implemented and who is responsible. A copy of the *Risk Treatment Strategies Register* is available by contacting the Bushfire Management Planning Unit: *cfs.bushfiremanagementplanning@sa.gov.au*

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Related Documents

Name of Document
A Template for a Local Council Roadside Vegetation Management Plan, Native Vegetation Council (2012)
AS 3959-2009/Amendment 3-2011; Construction of buildings in bushfire-prone areas (2009)
AS/NZS ISO 31000:2009 Risk Management - Principles and Guidelines (2009)
CFS – Code of practice – Vegetation and rubbish pile burning – (April 2015)
Crown Land Management Act 2009 (SA)
Department of the Premier and Cabinet South Australia's Strategic Plan - Creating Opportunity. Department of the Premier and Cabinet, Government of South Australia (2004)
Development Act 1993 Development Regulations (2008)
Emergency Management Act (South Australia) (2004)
Emergency Management in Australia Concepts and Principles Manual 1 (2004)
Environment Protection and Biodiversity Conservation Act (Commonwealth) Section 18 and 269AA (1999)
Fire and Emergency Services Act and Regulations (2005)
Guidelines for Plantation Forestry in South Australia 2009
Guidelines for the Management of Roadside Vegetation, Native Vegetation Council (2012)
Minister's Specification SA 76, Maintenance and testing of essential safety provisions, (2015 edition)
Minister's Specification SA 76A, Fire Safety Requirements in Caravan Parks and Residential Parks, (December 2007)
Minister's Specification SA 76C, Protection of buildings exposed to brush fences, November (2007)
Minister's Specification SA H3.2, Concessions for farm buildings, (2015 edition)
Murray Mallee – Bushfire Management Committee, Interim Bushfire Management Area Plan, (September 2012)
National Bushfire Management, Policy Statement for Forests and Rangelands (2014)
National Construction Code (Formerly the Building Code of Australia, BCA) (2016)
National Parks and Wildlife Act 1972 (SA)
Native Vegetation Act 1991 (SA) Section 29 (1991)
Native Vegetation Act 1991 and Regulations (2003)
Native Vegetation Regulations 2003 (SA) Section 5A-1 and 5(1)(zi) (2003)
SA CFS – Rural Fire Hazard Plan (2014/15)
South Australian Firebreaks, Fire Access Tracks and Sign Standards Guidelines (2015)
State Bushfire Management Plan (2010)
Wilderness Protection Act 1992 (SA)

Definitions and Acronyms

Name	Description
Agencies	Refers to any State or Federal Government Department that is the manager or owner of the land or asset.
AIRS	Australian Incident Reporting System
APZ	Asset Protection Zone is a fuel reduced area surrounding a built asset or structure.
AS/NZS ISO 31000:2009	AS/NZS ISO 31000:2009 Risk Management – Principles and Guidelines. The agreed international standard that dictates the fundamental principles behind risk management.
Asset	A term used to describe anything of value within communities that may be impacted by bushfire. This may include residential areas, infrastructure, commercial, environmental, heritage and community valued sites.
Asset Owner	The owner occupier or custodian responsible for the care or management of an asset. The responsibility may be defined by ownership, lease or contract. Also refer to the *Fire and Emergency Service Act 2005* for more information.
Asset Risk Treatment Strategies	Strategies allocated to modify the bushfire risk to specific assets that have been assessed.
BAL	Bushfire Attack Level is the level of radiant heat that is likely to impact on an asset
BBZ	Bushfire Buffer Zone consists of strategic firebreaks of sufficient width and continuity to provide a substantial barrier to the spread of bushfire.
BMA	Bushfire Management Area
BMAP	Bushfire Management Area Plan as defined under the *Fire and Emergency Services Act 2005 S73A*.
BMC	Bushfire Management Committee as defined under the *Fire and Emergency Services Act 2005 S72A*.
BOM	Bureau of Meteorology
BRIMS	Bushfire Risk Information Management System – A systematic process that identifies assets at risk from bushfire, assesses the level of risk, captures current and proposed risk treatments, risk treatment owners and time frames for implementation and provides a framework for continuous review and monitoring of the risks and their risk treatments.
Bushfire Hazard	The vegetation that poses a level of threat to human life, economic and cultural assets or environmental assets. The potential severity of a bushfire threat is determined by fuel load, fuel arrangement and topography under a given climatic condition.
Bushfire Risk	The concept of bushfire risk has three elements: a) the likelihood of a bushfire igniting and spreading to the hazard adjacent to and threatening an asset; b) the observable event of the hazardous vegetation igniting and c) the impact to the asset from a bushfire event.
Consequence	The term "Consequence" for the purpose of this plan, means "what will happen to the asset if it is impacted by a bushfire?" For example will it burn down, will it cease to function, will people be injured etc.? The elements that contribute to the consequence of a bushfire are the Bushfire Attack Level (BAL) (measuring the radiant heat) and either the susceptibility of occupants in human settlement assets or susceptibility of built structures.
DEWNR	Department of Environment, Water and Natural Resources
FBD	Fire Ban District

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Name	Description
FDI	Fire Danger Index
FDR	Fire Danger Rating
FDS	Fire Danger Season
FES Act	Fire and Emergency Services Act 2005
FPO	Fire Prevention Officer
Fuel Hazard Guide	The Fuel Hazard Guide aims to assist with defining and identifying the different components of Fuel Hazard through the assessment of Fuel Hazard levels for Surface, Near-Surface, Elevated and Bark Fuel
GAFMWG	Government Agencies Fire Management Working Group
Impact	The loss, or damage, to an asset from a bushfire.
Land Manager	The person, organisation or agency responsible for the care or management of an asset or land. The responsibility may be defined by ownership, lease or contract. Also refer to the *Fire and Emergency Services Act* 2005 *Section 3* for additional clarification.
Landscape Treatment Investigation Areas.	Landscape Treatment Investigation Areas have been proposed as areas of bushfire concern requiring further assessment and consultation with stakeholders to determine the most effective, acceptable and achievable vegetation management strategies to directly reduce the intensity and movement of fire through the landscape and the impact of bushfire on a cluster of assets.
Likelihood	The chance of a bushfire igniting and spreading to the hazard adjacent to and threatening an asset.
MURRM	Murray Mallee
Prescribed Burning	Prescribed burning is the planned application of fire under prescribed environmental conditions and within defined boundaries to achieve fuel hazard reduction management for bushfire risk mitigation and to achieve ecological, land management and research objectives.
Property Preparedness Zone	An area on or surrounding structures where the removal of hazardous vegetation and the elimination of ignition sources can reduce the impact of wind-blown burning embers, flame contact and intense heat generated by bushfires.
CFS	Country Fire Service (South Australia)
SAPOL	South Australian Police
SBCC	State Bushfire Coordination Committee
ZEMP	Zone Emergency Management Plan

APPENDIX 1: Murray Mallee Bushfire Management Committee Member Organisations

Listed below are the Member Organisations of the MURRM Bushfire Management Committee. It should be noted that although not members of the MURRM BMC, many other Government and non-Government organisations are consulted on, and contribute to the MURRM BMAP.

For further information on the roles and responsibilities of the Bushfire Management Committee and Member Organisations, please refer to:

- *Murray Mallee Bushfire Management Committee* and
- *Bushfire Management Committee Member Organisations*

MURRM BMC Member Organisations:

- Barmera Council
- Coorong District Council
- District Council of Karoonda East Murray
- District Council of Loxton Waikerie
- Mid Murray Council
- Rural City of Murray Bridge
- Renmark Paringa Council
- Department for Planning, Transport and Infrastructure
- Conservation Council of SA
- SA Police
- Primary Producers SA
- SA Country Fire Service
- SA Country Fire Service Volunteer Association
- SA Metropolitan Fire Service
- Southern Mallee District Council
- Department of Environment, Water and Natural Resources

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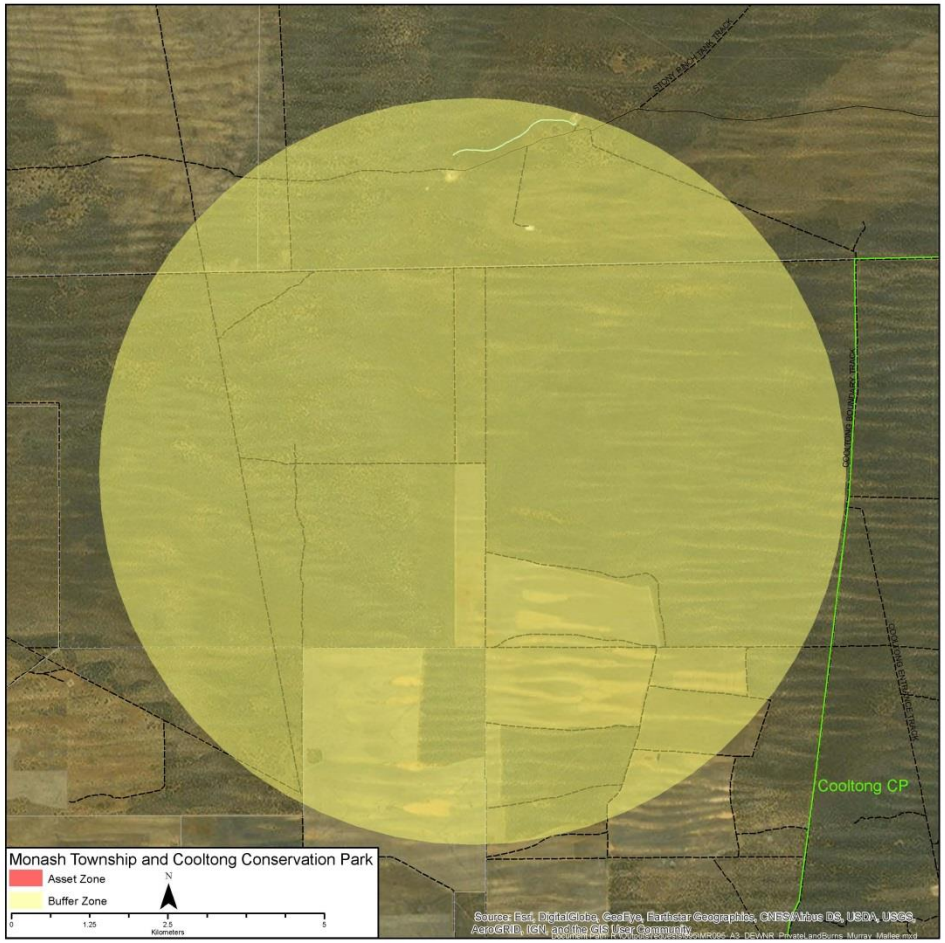
APPENDIX 2: Landscape Treatment Investigation Areas

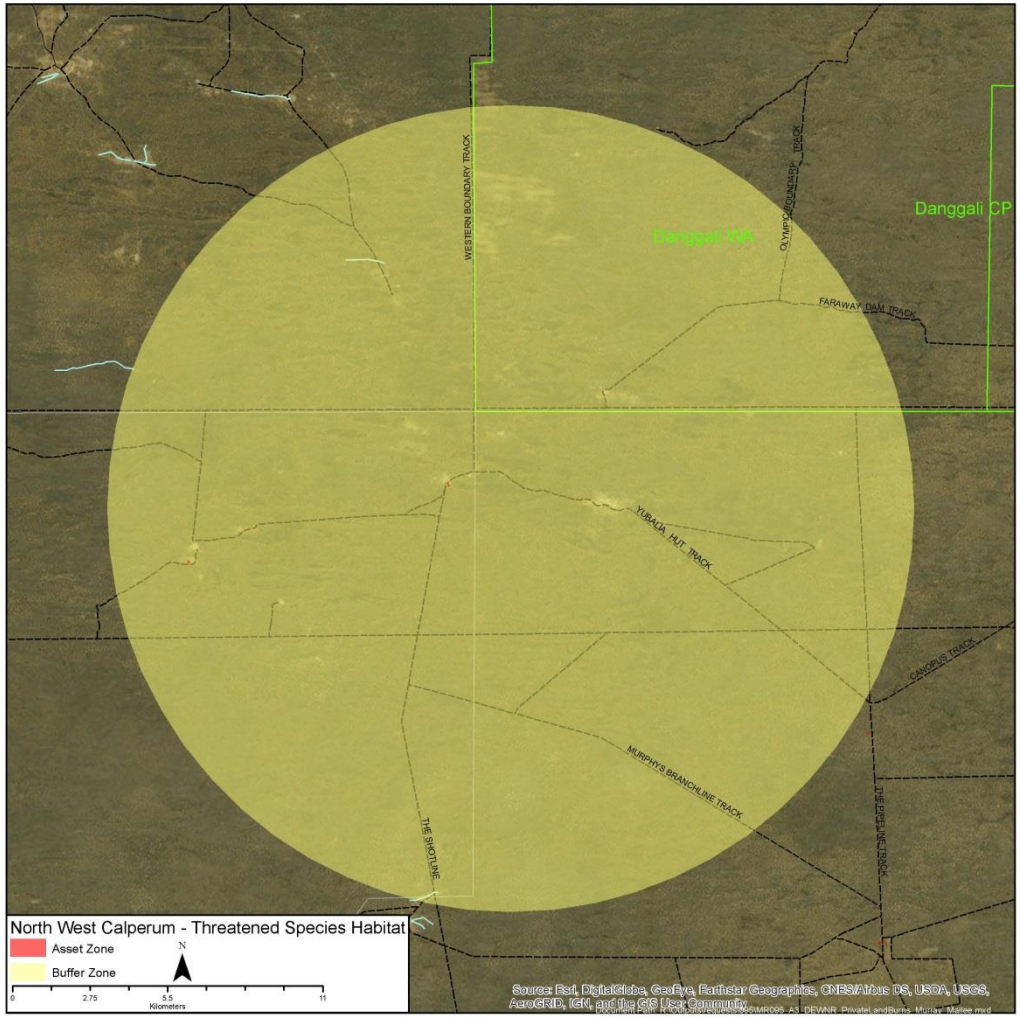
Map 1: Monash/Cooltong – Landscape & township protection & Environmental Assets

This area has been identified as a Landscape Treatment Investigation Area as the Monash township lies just south with multiple properties surrounded by scrubland and farming properties. It has also been identified as being strategically important to protect environmental assets to the east and north within Cootlong Conservation Park and Calperum. The aim of establishing mitigation strategies within this landscape is to protect private assets within the area from fire coming from the North through Calperum and Monash Station. Consultation with landholders would need to occur to establish the feasibility of implementing any fuel management strategies and potential for ecological benefits.



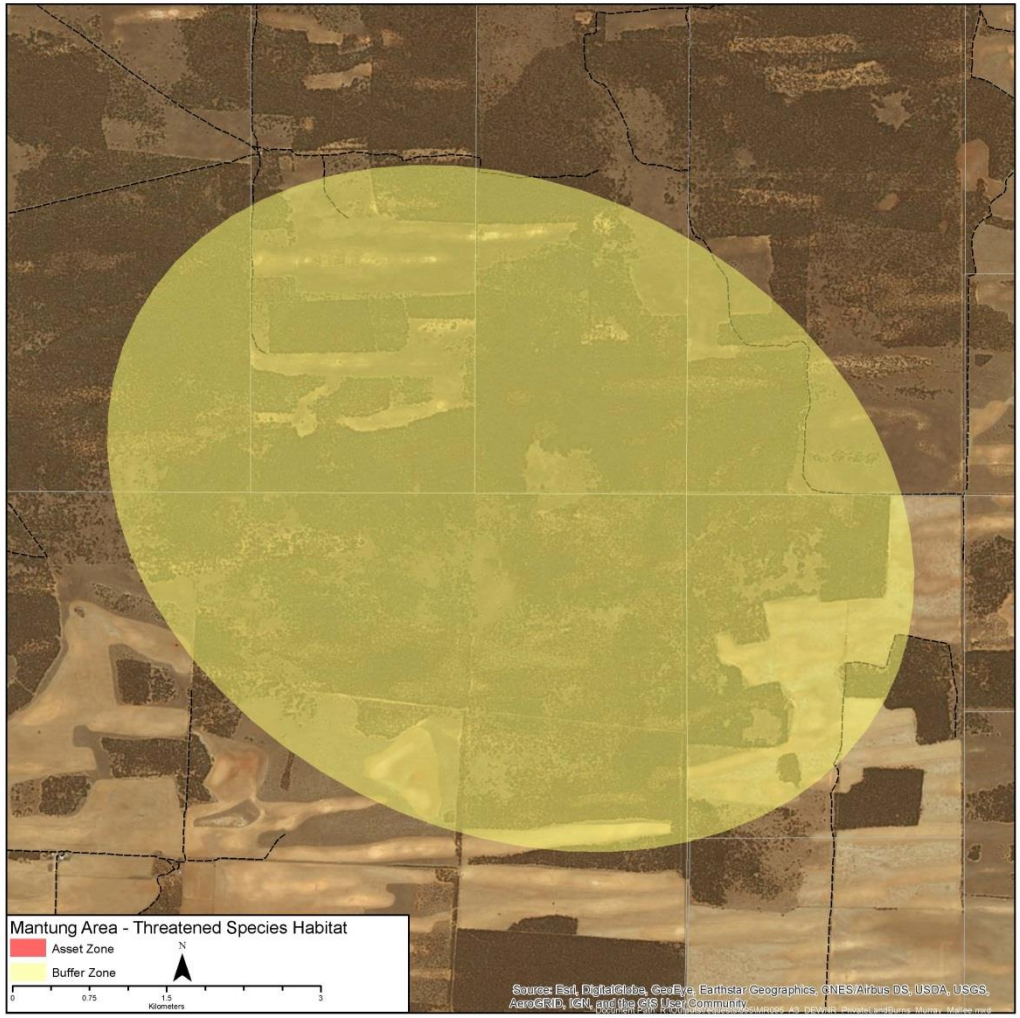
Map 2: North West Calperum - Landscape protection & Environmental Assets

This area of Calperum has been identified as important Mallee habitat for several threatened Mallee bird species. A Landscape Treatment Investigation Area would provide the landscape with varying fire age classes for landscape protection and will provide ecological benefits.



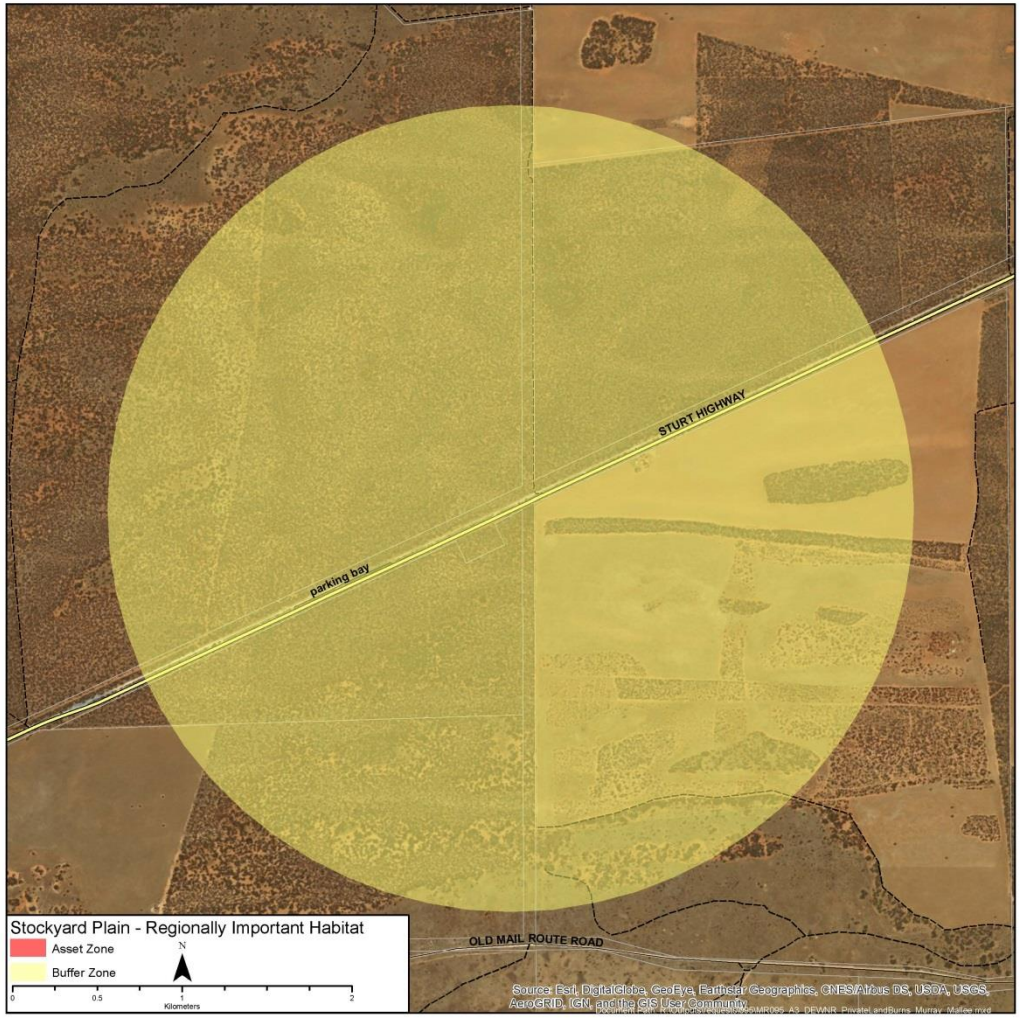
Map 3: Mantung area – Landscape protection & Environmental Assets

This area has been identified as regional important deep sand habitat for threatened Mallee bird species. This area would benefit from Landscape Treatment Investigation Area due to habitat condition and large continuous scrubland which could ecologically benefit from fire.



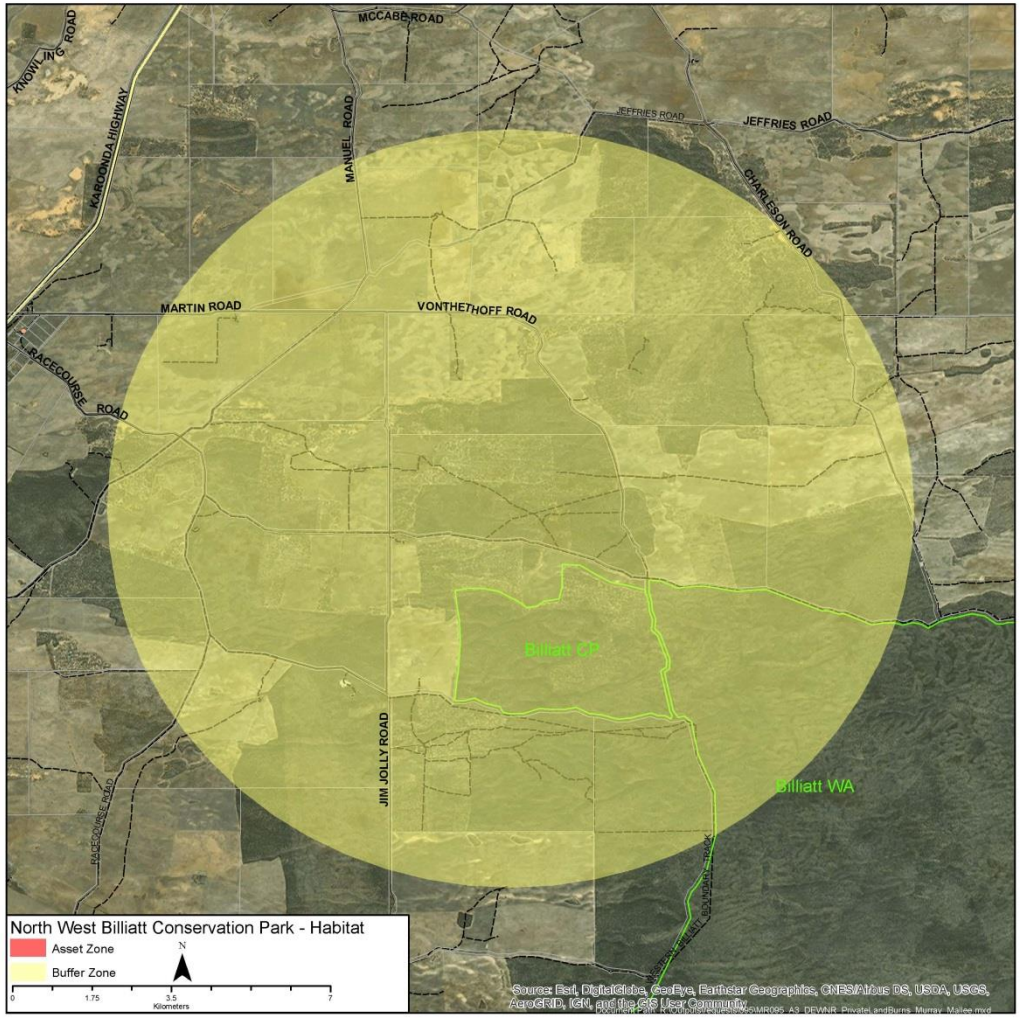
Map 4: Stockyard Plain – Landscape/highway protection & Environmental Assets

This area has been identified as a Landscape Treatment Investigation Area due to the National Sturt Highway intersecting a large section of continuous scrubland that contains regional important habitat. Ensuring the landscape has varying fire age classes is important for landscape protection.



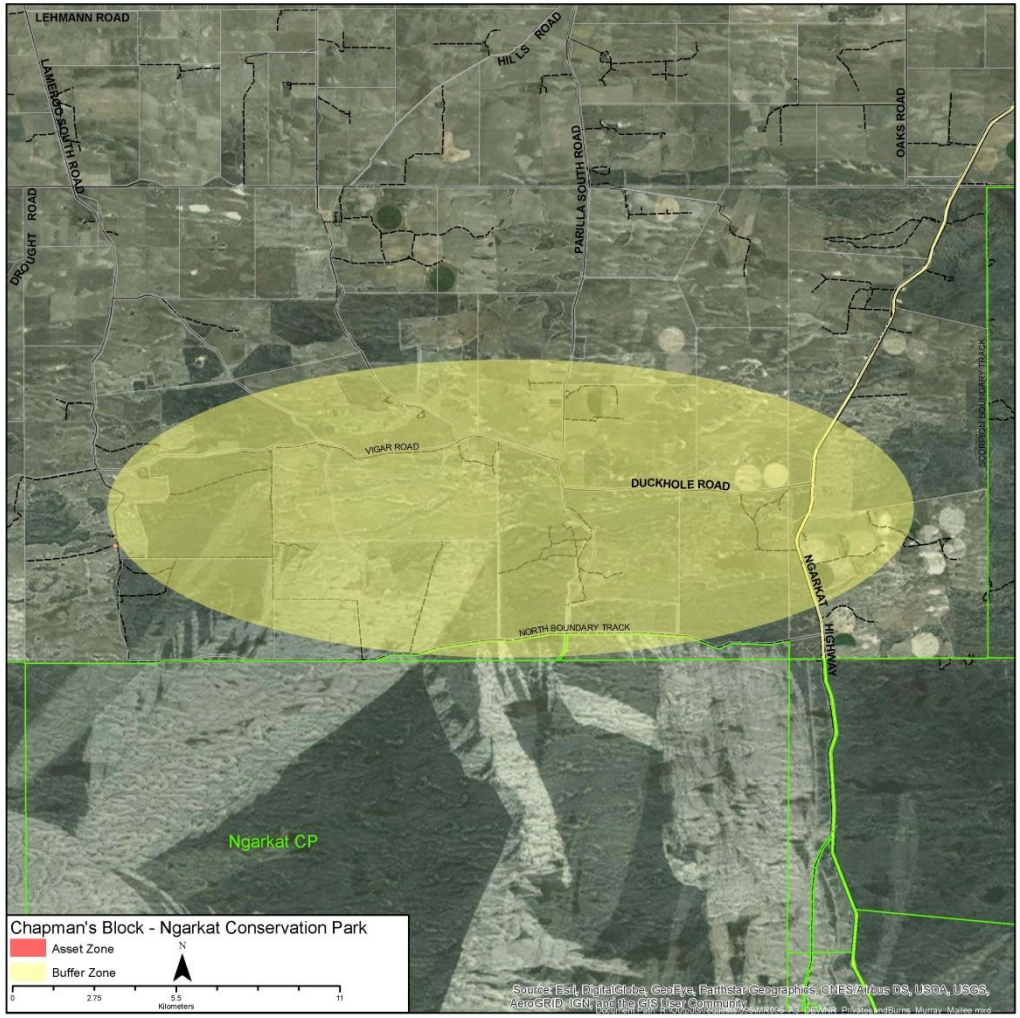
Map 5: North West Billiatt Conservation Park/Sandalwood - Landscape protection & Environmental Assets

The North West area of Sandalwood near Billiatt Conservation Park has been identified as a Landscape Treatment Investigation Area due to the importance of maintaining underrepresented Mallee habitat which will provide ecological benefits for several threatened Mallee bird species. Ensuring the landscape has varying fire age classes is important for landscape protection.



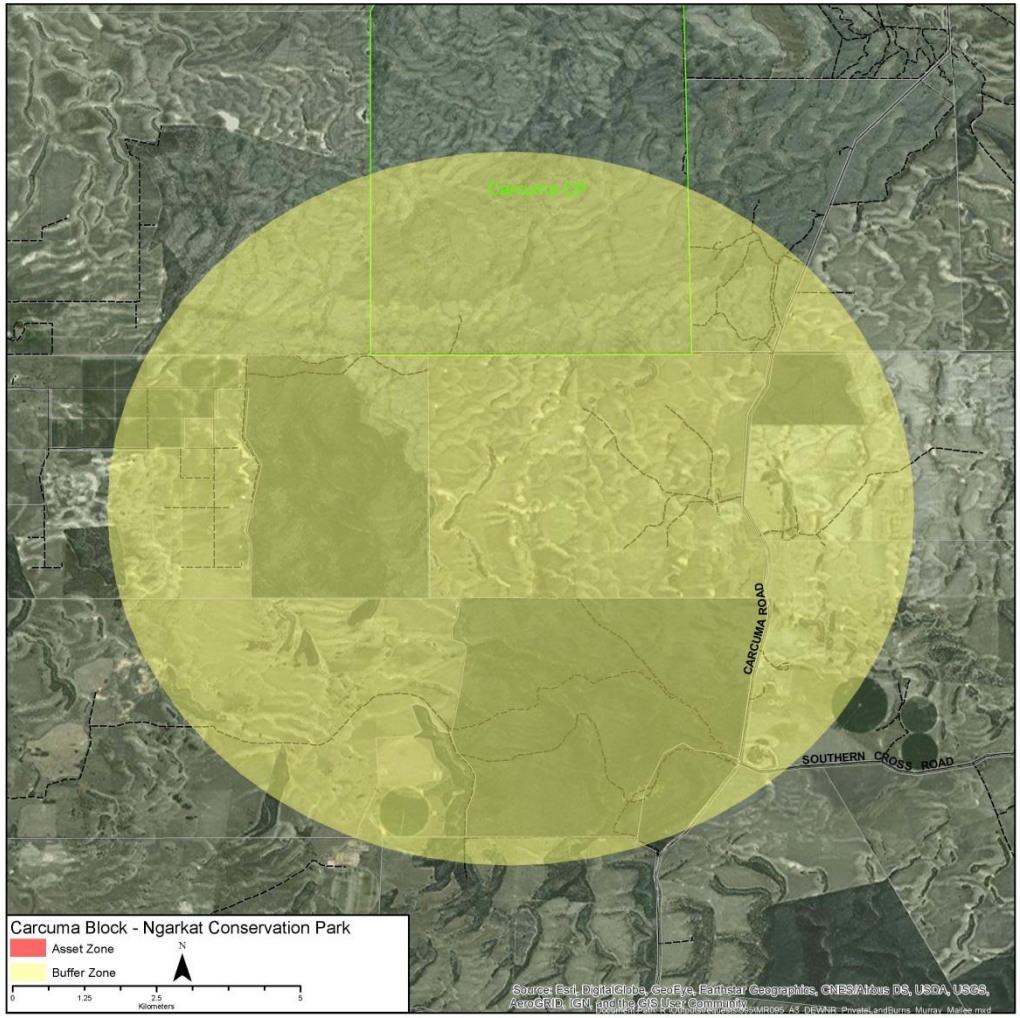
Map 6: Chapmans Block - Landscape protection & Environmental Assets

This Landscape Treatment Investigation Area has been identified due to the connection and extension with Ngarkat Conservation Park. Ensuring the landscape has varying fire age classes is important for landscape protection and maintaining old and young Mallee heath communities which will provide ecological benefits.



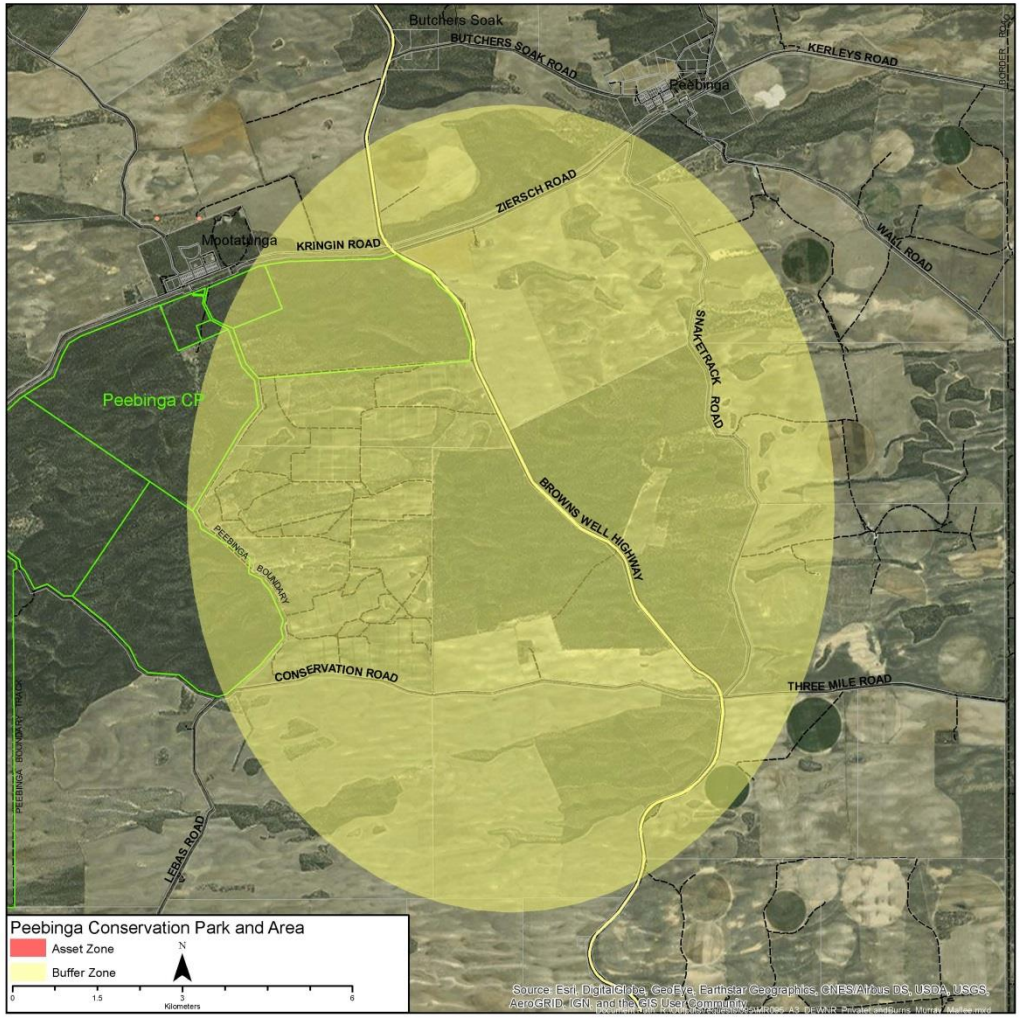
Map 7: Carcuma Block - Landscape protection & Environmental Assets

This Landscape Treatment Investigation Area has been identified due to the connection and extension with Ngarkat Conservation Park and surrounding farming and apiary industry. Ensuring the landscape has varying fire age classes is important for landscape protection and maintaining under-represented Mallee heath communities.



Map 8: Peebinga area – landscape/Hwy protection & Environmental Assets

This Landscape Treatment Investigation Area has been identified due to the connection and extension with Peebinga Conservation Park and Murray Sunset National Park, surrounding farming and isolated large patches of scrubland. Ensuring the landscape has varying fire age classes is important for landscape protection and will provide ecological benefits.



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