

KANGAROO ISLAND



BUSHFIRE MANAGEMENT AREA PLAN



This Plan has been developed as part of a project funded by the Natural Disaster Resilience Program (NDRP) in partnership with the Commonwealth and State Government of South Australia.

Cover photo was taken by CFS Air Attack Supervisor, Commander D Pearce at a fire at Seal Bay, Kangaroo Island on the 11 January 2016. The picture depicts a fire in the landscape impacting on a strategic fire break on the boundary of Seal Bay Conservation Park.

Document Control

Version	Date	Summary of Changes	Author
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Endorsements

This document requires the following endorsements by the KI BMC:

Version	Date	Name	Title	Signature
1	24 February 2017	B. Loughlin	Chair, KI BMC	

Approvals

This document requires the following approvals by the SBCC:

Version	Date	Name	Title	Signature
1.0	19 May 2017	Greg Nettleton (CFS Chief Officer)	Chair, State Bushfire Coordination Committee <i>(on behalf of the SBCC)</i>	

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. KI (KI) is a bushfire prone environment with people, assets and areas of environmental sensitivity at risk from bushfire. 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 KI Bushfire Management Area Plan (BMAP) comprises of three parts:

- This written component outlining the planning process, content and other relevant information.
- An interactive spatial web-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 KI BMAP assets and their risk rating.

Prevention and preparedness are vital components in reducing injuries and deaths, loss of assets, financial costs and aiding community recovery. The KI 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 focusing on business continuity, emergency response or asset replacement costs.

The KI 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 KI Bushfire Management Committee ensures the Plan is regularly reviewed and updated and that public consultation processes are undertaken where required. ([Refer to Section 3: Roles and Responsibilities](#) & [Section 6: Monitoring, Reviewing and Reporting](#)).

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 KI BMAP, 19 May 2017, 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.

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:

- a. Identify existing or potential risks to assets from bushfire within the BMA

- b. Outline coordinated and collaborative bushfire prevention and mitigation strategies to achieve appropriate hazard reduction associated with bushfire management within its area
- c. Identify asset or land custodians responsible for the implementation of bushfire mitigation treatments
- d. Use or establish principles and standards to guide or measure the success of the bushfire management strategies and initiatives.

The purpose of the KI BMAP is to provide strategic direction for bushfire management planning in the KI Bushfire Management Area (BMA) ([refer to location map on page 8](#)), through the identification of strategies for bushfire risk modification to selected assets and areas 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 works plans for areas of land under their responsibility. Works plans, approved by the BMC, will guide the establishment/development of bushfire mitigation works across the BMA. 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 Kangaroo Island region, current treatment strategies have been revised and some measures removed, amended or added and they aim to improve the resilience of the community and assets identified in the plan to bushfire. ([Refer to Section 4: Risk Assessment](#) and [Section 5: Risk Treatment Strategies](#)).

The scope of the KI BMAP encompasses a range of asset categories and landscape wide areas at potential risk from bushfire. Asset categories include areas of human settlement; industrial and business areas; and assets of cultural significance to local communities and those contained in the State heritage register ([Refer Section 4.1: Assets at Risk from Bushfire](#)). Areas of concern where multiple assets were potentially at risk, or there was history or potential for the movement of bushfire through the landscape, were identified as part of the Kangaroo Island Bushfire Risk Management Plan 2009-2014 (KIBFRMP)¹. These areas have been reviewed by the BMC and informed the development of this BMAP. Other Landscape Treatment Investigation Areas have also been identified ([Refer to Section 5.2.1: Landscape Risk Treatment and Investigation Areas](#)).

¹ The Kangaroo Island Bushfire Risk Management Plan 2009-2014 was developed as a pilot bushfire risk management plan using the New South Wales Rural Fire Service bushfire risk management planning model.

Bushfire safety requires a partnership approach and is a shared responsibility between government agencies, the private sector, non-government organisations, individuals 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.

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 as outlined in the *Fire and Emergency Services Act*. The risk assessment process focusses predominantly on factors that can be measured (vegetation, fire intensity, separation distances, weather, topography, building resilience, access routes etc.) and what can be managed by applying treatment strategies.

The objective of this plan is to:

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

Assessment of the strategies to protect other assets within the KI 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 covered in plans, policies and procedures of government and non-government emergency and community service agencies.

Scope of Risk Assessment

It is not currently feasible to include and risk assess every parcel of land, building or area on Kangaroo Island. However, this does not mean that land, assets, communities or people who are not specifically identified in the online Plan map by a point, polygon or line have no level of bushfire risk. 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 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.

Environmental Assets

A formal process for the risk assessment of environmental assets is being developed for application in the SBMAP and 9 regional 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 incorporated into future iterations of the BMAP. ([Refer to Section 4.2.4: Environment](#)).

Aboriginal Heritage

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, 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 the potential inclusion of assets of Aboriginal significance in the Plan.

Implementation

This KI 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.

Best Available Information

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.

Weather conditions play a significant role in the likelihood of a bushfire occurring and its behaviour and intensity, should it occur. As part of determining these calculations, risk assessments have been based on inputs derived from Bureau of Meteorology (BOM) weather data over the fire danger season (October to April) for the last 5-7 years for the fire ban districts in each bushfire management area throughout the state.

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 2005 Section 73A- Bushfire Management Area Plans*. In particular *Section 73A(1)* requires the BMC to prepare and maintain a BMAP for its area. *Section 73A(3)* outlines that the BMAP must:

- identify existing or potential risks to people and communities within its area from bushfire; and
- 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
- identify action that should be taken by people, agencies and authorities to achieve appropriate standards of bushfire management within its area; and
- 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
- include or address other matters prescribed by the regulations or specified by the SBCC.

The following *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—

- has not been prepared under this Act in relation to a particular part of this State; or*
- 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
- 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.

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 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 Act, 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:

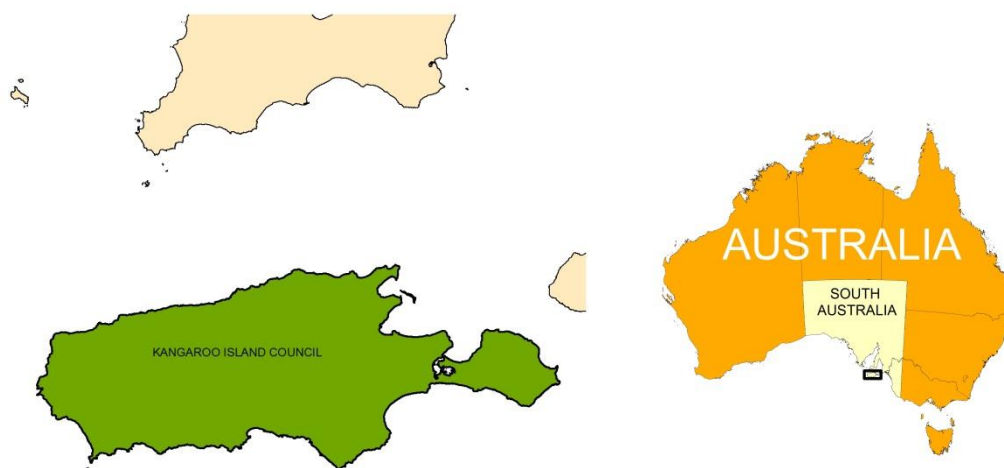
- [*Native Vegetation Act 1991 \(SA\) Section 29*](#)
- [*Native Vegetation Regulations 2003 \(SA\) Section 5A-1 and 5\(1\)\(zi\)*](#)
- [*Environment Protection and Biodiversity Conservation Act 1999 \(Commonwealth\) Section 18 and 269AA*](#)
- [*Code of Practice for fire management on Public Land in South Australia 2012-2016*](#)
- [*National Parks and Wildlife Act 1972 \(SA\)*](#)
- [*Wilderness Protection Act 1992 \(SA\)*](#)
- [*Crown Land Management Act 2009 \(SA\)*](#)
- [*Aboriginal Heritage Act 1988*](#)
- [*Development Act 1993 Development Regulations 2008*](#)
 - *(This Act will be repealed by Sch 6 cl 2 of the 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.

2 KANGAROO ISLAND BUSHFIRE MANAGEMENT AREA PLAN

2.1 Location

Kangaroo Island 110 km south-west of Adelaide and is located 15km south west of the western tip of the Fleurieu Peninsula in South Australia. It is accessible by plane or via ferry across Backstairs Passage. The KI BMAP has been developed for the KI BMA region of South Australia. The BMA boundary incorporates the whole Island and encompasses the single council area of Kangaroo Island Council. (See map below). Kangaroo Island is Australia's third largest island with 509km of coastline, 155km east to west and 55km at its widest point.



Map 1: Kangaroo Island Bushfire Management Area

2.2 Fire History

The Kangaroo Island area has on average 26-30 bushfires per year, of which on average one can be considered to be a major or campaign fire. Between the 1997/1998 and 2007/2008 fire danger seasons, Kangaroo Island experienced 10 major or campaign fires, with the smallest being 200ha and the largest over 90,000ha. Half of these fires were over 2,000ha. The majority of the major fires are concentrated around the Gosse and Seddon plateaus, and the southern coastal bushlands on the eastern end of the Island. The Kangaroo Island Fires Complex in December 2007 during which, dry lightning ignitions resulted in excess of 90,000ha being burnt, the loss of one life and significant assets.

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

2.3 Topography

Kangaroo Island covers an area of 430,054 hectares with its highest point 299 metres above sea level on the Gosse Plateau. Much of the eastern part of the island has been cleared for agriculture and many unique plant communities in this area are under threat. Of the remaining native vegetation, 64 per cent is conserved in government reserves or under vegetation heritage agreements. Nearly 30 per cent of the island is reserved under the *National Parks and Wildlife Act 1972* and the *Wilderness Protection Act 1992*.

2.4 Water Catchments

SA Water owns a very small proportion of the catchment area of Kangaroo Island. Its largest landholding is the Middle River Reservoir Reserve (~677 ha, primarily native vegetation). The Reservoir catchment is located 50km west of Kingscote, in the north-western part of Kangaroo Island. The total catchment area for the Middle River Reservoir is 101 km² (10,000 ha). Major land uses include pasture lands (~40%), plantation forestry (~24%), nature conservation areas (~12%) and other uses (~24%).

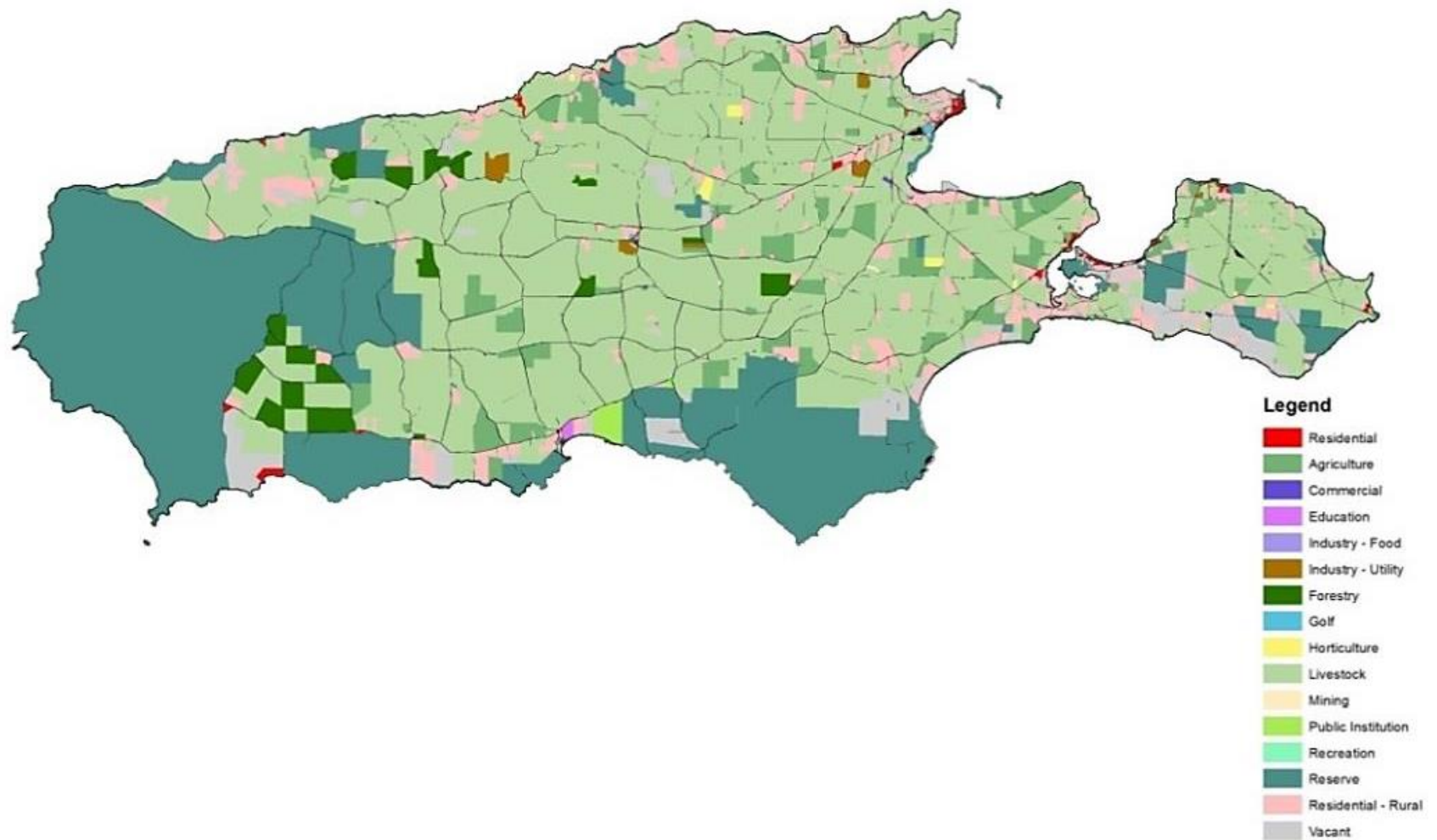
2.5 Land Tenure

The area of Kangaroo Island is 430,054 hectares. Around one third of this area is managed by the Department of Environment, Water and Natural Resources (DEWNR) in parks and reserves. Most of the remaining two thirds is privately owned and managed agricultural land and forestry plantations. Kangaroo Island Council and SA Water have relatively small areas of land under their care and control, with road reserves making up the bulk of the land under the care and control of Council. The Council is responsible for the management of 1,300km of unsealed roads and 250kms of sealed roads.

- Private ownership – residential and industrial/commercial and conservation including Vegetation Heritage Agreements under the *Native Vegetation Act 1991*.
- Council managed areas
- SA Water
- Forestry SA
- DEWNR
- Commonwealth and State Crown lands
- Aboriginal Managed Land
- Mineral exploration and development licences (under *Mining Act 1971*)

2.6 Land Use

Around one third of the KI BMA area is managed by the Department for Environment, Water and Natural Resources (DEWNR) in parks and reserves. Most of the remaining two thirds is privately owned and managed agricultural land and forestry plantations. The agricultural sector, consisting mostly of sheep, wool, grains, fishing and forestry, continues to be a significant contributor the Island's economy, providing the major source of employment for around 20% of the resident population (Australian Bureau of Statistics, 2011).



Map 2: Land use on Kangaroo Island

2.7 Climate

2.7.1 Temperature

The KI BMA can be described as mild Mediterranean with a strong maritime influence. Summer temperatures from December to March are warm to hot, with low humidity and very dry conditions. Winters are cool to mild with the majority of the Island's rain falling in this period of April to September.

2.7.2 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
- 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](#)

Changes in climate and Kangaroo Island's decreased rainfall in recent years is having a range of impacts by reducing recharge of the Island's aquifers, increasing bushfire frequency and intensity, affecting primary production and the health of the landscape.

2.7.3 Wind and Weather Patterns

South easterly winds are common in spring and summer from November through March, with occasional hot dry northerly winds coming from the mainland. The lightest winds are typically April through June. Local maritime influences can cause significant variations in wind speed and direction within the Island.

Weather patterns typically move in from the west in summer featuring hot dry high pressure systems. However, there are few occasions when these conditions push all the way to the south coast of the Island. In winter, regular cold wet fronts move in from the south west. From October to December Kangaroo Island can experience severe weather conditions with thunderstorm and associated lightning activity, often concentrated around the more elevated areas of the Island on the Gosse and Seddon Plateaus. The hottest months are January and February, which generally coincide with grass curing and low soil moisture.

2.7.4 Rainfall

Most rainfall occurs from April through September and typically falls from fronts moving in from the west and south across the Southern Ocean. The average rainfall varies considerably in different areas of the island.

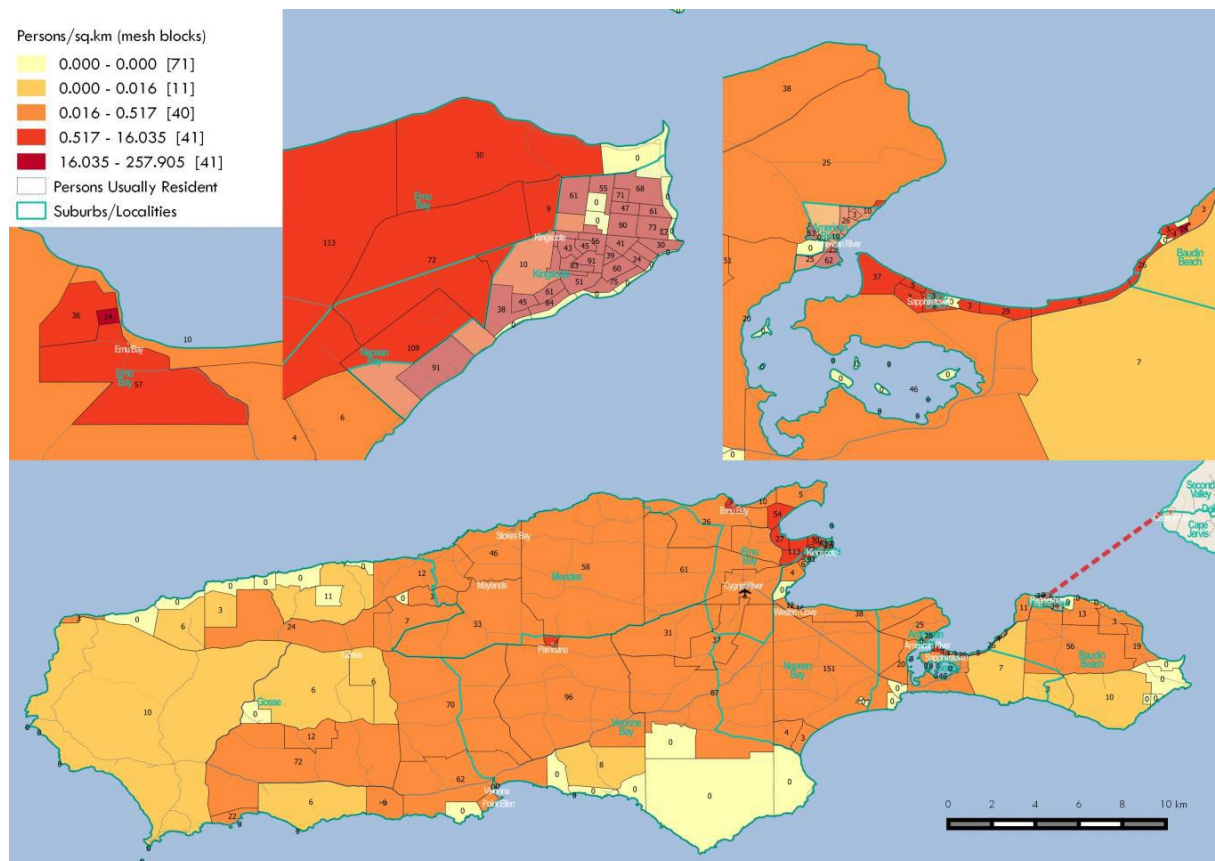
2.7.5 Fire Ban District and Bushfire Season

Kangaroo Island is a distinct Fire Ban District. The 2015/16 Fire Danger Season dates for Kangaroo Island ran from 17 November 2015 to 15 April 2016. Fire Danger Season (FDS) dates are set annually by the CFS Chief Officer based on recommendations from the KI BMC.

2.8 Population and Demographics

The population of Kangaroo Island is approximately 4,400 people. The major population centre is Kingscote/Brownlow with almost 40 per cent of the island's population residing there. Other settlements include Penneshaw, Parndana and American River, with smaller settlements at Vivonne Bay, Island Beach, Baudin Beach, Western Cove, Nepean Bay, Stokes Bay and Emu Bay, and rural properties throughout the Island. A significant proportion of Island landholders do not reside on the Island (38% at the 2011 Census).

Penneshaw and Kingscote have Bushfire Safer Precincts. The population outside of these two precincts may be at risk from bushfire. The island receives approximately 126,000 visitors each year and this figure is gradually increasing (SATC 2015). Approximately half the Gross Regional Product is derived from the tourism sector as Kangaroo Island is an iconic tourism destination. Approximately 30% of visitors to the Island are international, of whom around 82% may not speak English as their primary language. Among these, visitors from Asia in particular – approximately 3.3% of visitors in 2015 – may have limited or no experience of bushfire prone environments (SATC 2015).



Map 3: Kangaroo Island Population Distribution map

Kangaroo Island geographic population distribution & density (RAI 2015, Mesh Block Counts 2011, ABS cat. no. 2074)

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 Kangaroo Island Bushfire Management Committee

The KI 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 seeks to assess the strategic bushfire management needs of the BMA across the landscape and as such is tenure blind.

The key function of the KI 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 bushfire negatively impacting on the values of life, property, and the environment in accordance with the *FES Act 2005*. The role and responsibility of KI 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.

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 treatments or issues identified in the plan.
- Ensuring input into the planning process by their BMC representatives
- Providing information and make decisions on bushfire planning issues within the area
- Reviewing the Bushfire Management Area Plan information and drafts and making amendments if required
- Determining methodologies for community and public consultation on key components of the BMAP
- Assessing and endorsing BMAP updates or changes

The KI BMC member organisations include:

- CFS
- DEWNR
- Kangaroo Island Council
- Conservation Council of South Australia
- SAPOL
- CFS Volunteers Association
- KI NRM Board
- Agriculture Kangaroo Island
- SA Water

3.4 Community

Bushfire prevention and preparedness is a shared responsibility of the State government fire agencies and volunteers, local government, individuals, land and building managers (public and private), and the broader community. The BMAP is premised upon the responsibility of all persons in the KI BMA for the mitigation of the bushfire risk for themselves, their neighbours and their community, and their need to understand and participate in bushfire prevention and preparedness. This point is particularly relevant to those assets, communities or people who have not been specifically identified by a point, polygon or line within this BMAP.

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

- a) to prevent or inhibit the outbreak of fire on the land; and*
- b) to prevent or inhibit the spread of fire through the land; and*
- c) to protect property on the land from fire; and*
- d) to minimise the threat to human life from a fire on the land*

To support the observation of bushfire prevention and management activities by the community, local government Fire Prevention Officers within the KI BMA are required by the *FES Act 2005* to: assess the extent of bushfire hazards within the council area; provide advice to land holders on bushfire prevention and preparedness; and enforce the provisions of the *FES Act 2005* on private land.

There are many conservation and recreation parks across the island and people visiting these areas need to recognise that they may, at times, be at risk from bushfire. Risk treatment measures are identified and implemented by DEWNR through their Fire Management Plans with aim of reducing the risk to life and property, such as signage, track and infrastructure upgrades, water access points, and park closure policies on Total Fire Ban days, and fuel reduction activities.

Visitors to National Parks and Reserves are reminded that agency policies allow for the temporary closure of publicly-managed lands on days declared a Total Fire Ban (TFB) (DENR 2010d; Government of South Australia 2013; SA Water 2008). Reserves may also be closed in the event of a bushfire within or threatening a reserve or during other fire management operations, such as prescribed burning. DEWNR reserve closures will be implemented on days declared a TFB where there is a catastrophic risk of bushfire.

SA Water land is closed permanently to the public including the Middle River Reservoir Reserve.

The CFS has an *Evacuation Policy (CFS 2009c)*, which explains that as far as is possible, members of the community should decide for themselves whether to stay or go when threatened by an emergency. Directed evacuation will only be undertaken by the South Australia Police and Emergency Services when it is safe to do so and adequate resources are available. Agencies will comply with all requests from these authorities in evacuating visitors, lessees, and residents from reserves during an emergency.

Information relevant to all members of the community on bushfire prevention and preparedness can be found on the following link: http://www.cfs.sa.gov.au/site/resources/fact_sheets.jsp

4 RISK ASSESSMENT

Risk assessment is undertaken as assets are identified for inclusion into the online mapping and Risk Register. The risk assessment process is designed to assess the risks to structures, property and life within built assets. A process for determining risk to environmental assets is currently under development.

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 vulnerability of people to bushfire threat
- 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 as being at risk from bushfire within this BMAP were derived in the first instance from the KIBFRMP 2009-2014. They have been re-assessed within the BMAP framework with input from local government, infrastructure agencies, business groups, State Government agencies, KI BMC working groups, CFS, community groups and geospatial resources.

The life and property assets in this plan are geographically identified and presented with a colour coded 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 recorded information relating to the identified 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 KI BMA.

The assets considered within this current plan are divided into three classes: Human Settlement, Economic, and Cultural Heritage. 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**.

Asset Class	Asset Category
Human Settlement	• Residential • Special Fire Protection • Other
Economic	• Infrastructure • Commercial or Industrial
Cultural Heritage	• Community • Historic • Other
Environmental	• Flora • Fauna • Ecological communities (Refer to Section See 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.

Roads may be considered a human settlement asset because of their potential to be used for evacuation or relocation and firefighting response during bushfire.

4.1.2 Economic

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.

4.1.4 Environmental

At the time of preparing this plan, a risk assessment process and related treatment management strategies for environmental assets is being developed 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 Regional Species Conservation Assessment for Kangaroo Island (Gillam & Urban 2014²). No risk mitigation treatment should be undertaken in native vegetation until these environmental assets have been identified through an environmental assessment process. Further information on this process is included in [Section 4.2.4: Bushfire Risk Assessment - Environment](#).

4.1.5 Assets and Areas not risk rated

Land, assets, communities or people who are not specifically identified in this Plan by a point, polygon or line may still have a level of bushfire risk. This is particularly relevant to the more sparsely populated areas outside of the rural townships. Landholders in the KI 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 Refuges 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

Risk assessments analyse a potential hazard and consider both the likelihood and consequence of an event occurring. These two factors combine to give an overall appreciation of the level of risk. For example, an event that is unlikely to happen and would have little consequence if it did happen would be considered a low risk; while an event that is likely to happen and would have significant negative consequences would be a high risk.

²Gillam, S. and Urban, R. (2014) *Regional Species Conservation Assessment Project, Phase 1 Report: Regional Species Status Assessments, Adelaide and Mount Lofty Ranges NRM Region*. Department of Environment, Water and Natural Resources, South Australia.

In terms of assessing risk to life, property and the environment in the context of this plan, the following assumptions were made:

Likelihood was based on:

- (a) a bushfire igniting in the surrounding landscape and spreading to the vegetation adjacent to the asset; and
- (b) a bushfire event (flame, radiant heat and embers) directly igniting the asset or igniting the vegetation immediately adjacent to an asset, resulting in an impact to the asset.

Consequence was assessed as loss or damage to the asset from the bushfire event.

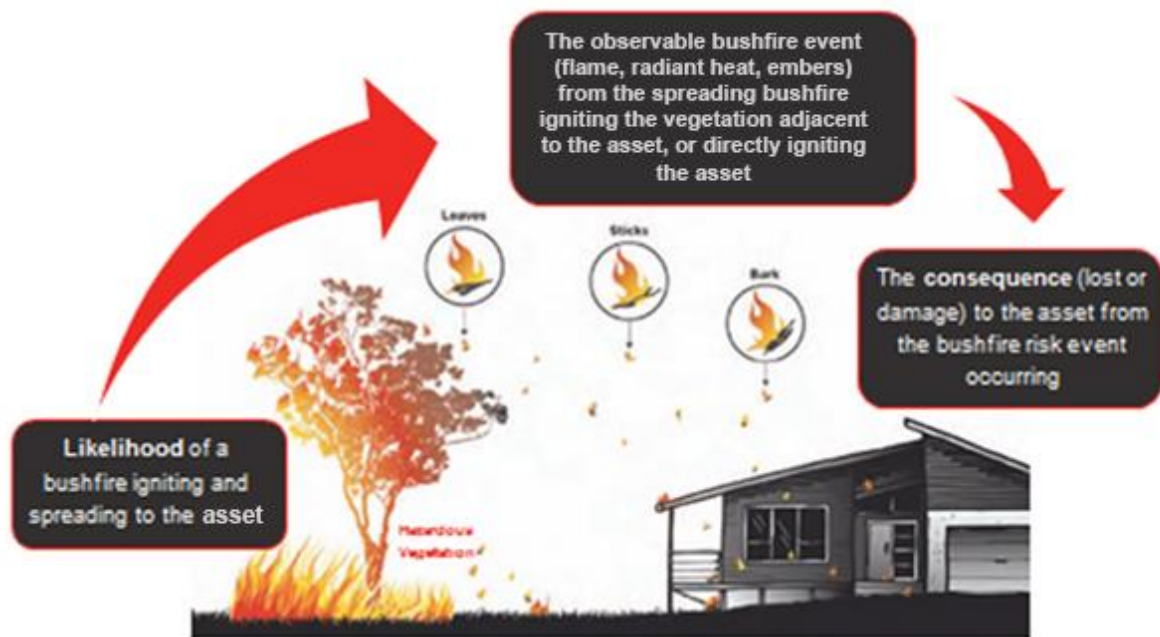


Figure 1: Bushfire Risk Diagram

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. This is to enable the 99 percentile values to be utilised for the Bushfire Management Area Planning in setting the weather context.

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.

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 is defined by the questions: “what will happen to the asset if it is impacted by a bushfire?” For example will it burn down, will it be destroyed and cease to function, will people be injured etc.? It does not refer to the social, financial or business continuity consequences of losing the asset. These higher level consequences are to be considered following direction from the State Bushfire Management Plan 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 Area Plans.

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*.

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 process 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 and the building standard, the distance of the vegetation from the building, the slope of the land and the height of the most exposed part of the building (typically the eaves). 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/m² 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.

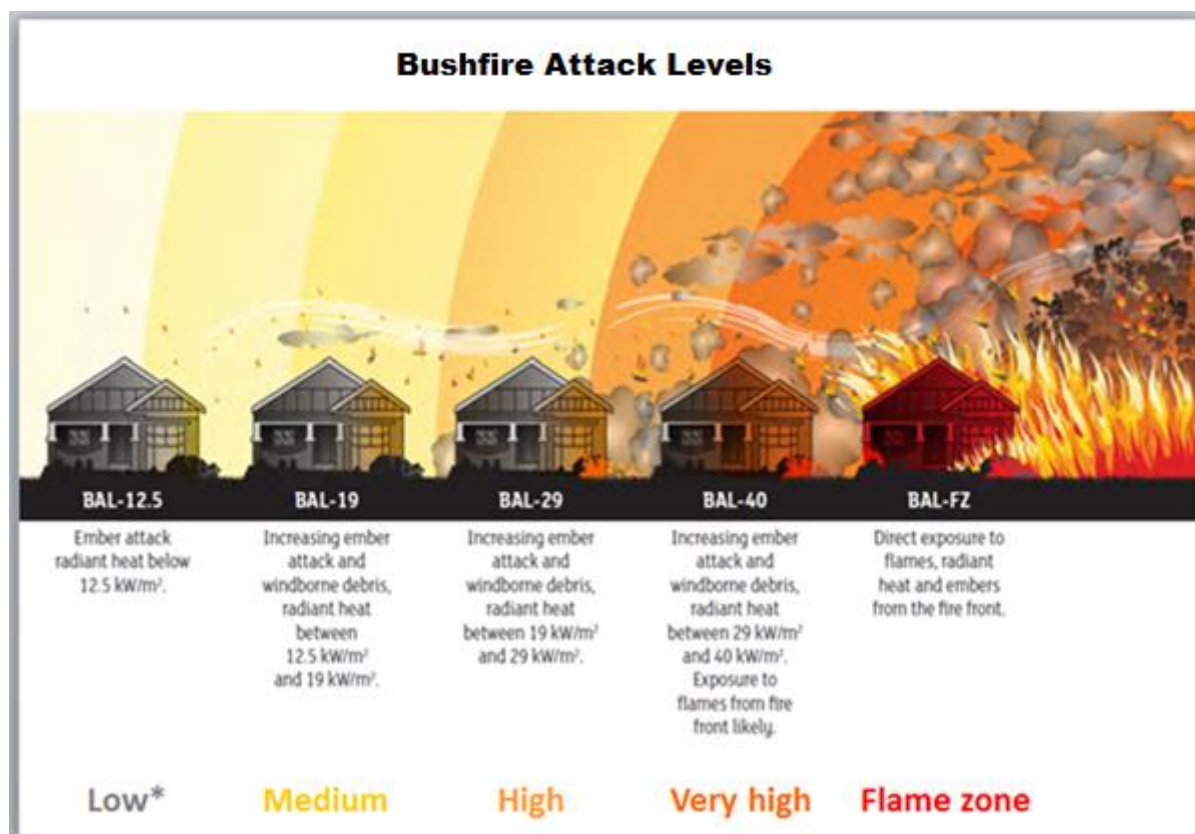


Figure 2: Bushfire Attack Levels

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: an understanding of 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 KI 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 in the next iteration of this BMAP is currently being developed. Prior to the approval of the addition of these assets and related information into the BMAP, a six week period of public consultation regarding the additions 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 KI BMA incorporates lands included within the following DEWNR and SA Water fire management plans:

- Cape Forbin Fire Management Plan 2009-2014 (extended to 2018)
- Flinders Chase Fire Management Plan 2009-2014 (extended to 2018);
- Cape Gantheaume Fire Management Plan 2012-2022; and
- Draft Dudley Peninsula Draft Fire Management Plan 2016-2026 (in prep).
- Middle River Reservoir Reserve SA Water Fire Management Plan

The recommendations made within these DEWNR fire management plans are supported by the KI BMC, and are included in the KI BMAP.

The Cape Forbin and Flinders Chase fire management plans have been, with Native Vegetation Council approval, extended as an interim measure as they were due for review. The DEWNR fire management zoning and bushfire management strategies for the *draft* Dudley Peninsula Fire Management Plan will be incorporated into the KI BMAP once finalised.

Environmental assets that will 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 protected areas, Crown lands, other lands managed by government agencies, roadside vegetation, private protected areas (Vegetation Heritage Agreements 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:
 - 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*.
 - 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.
 - 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).
- Water catchment areas
- Revegetation projects
- Significant habitat elements (e.g. tree hollows)

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>

4.2.5 Risk Ratings

Table 2 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: Overall Risk Rating Matrix below). 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 priority 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. It is important to also consider the type of asset being impacted by a bushfire, the level of risk that may be considered acceptable, and whether the 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 higher priority for risk treatments than a communication tower rated as extreme.

		Consequence			
		Minor	Moderate	Major	Catastrophic
Likelihood	Almost Certain				
	Likely				
	Possible				
	Unlikely				

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 be 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:

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 defensible from the potential impacts from a bushfire should a bushfire approach. Surrounding vegetation is either likely to be a significant distance away or of low levels.

Medium

Properties and assets are likely to be defensible 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 firefighting amenities and separation distance are susceptible to the impacts of bushfire which is likely to reach assets with surrounding vegetation and topography fuelling fire intensity and behaviour.

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 for the ability to be able to defend a property from the effects of a bushfire due to continuous or dense vegetation or challenging topography.

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 KI BMC will allocate mitigating risk treatment strategies to reduce the risk to assets within the KI BMA. To facilitate this, the SBCC has endorsed risk treatment strategies that include both asset specific and BMA wide treatments.

For a full list of all 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 is under development regarding the guideline for creating and maintaining APZs, BBZs and Conservation Zones.

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 impact of bushfire to a number of assets and across the 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 impact of bushfire depending on the targeted outcome of the program.

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 programs, 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 programs
- State and local planning frameworks such as the State Bushfire Management Plan, KI Bushfire Management Area Plan, local Council roadside vegetation management strategies
- DEWNR, SA Water and Forestry SA land fire management policies and plans which sets out a range of mitigation strategies to minimise the impact of bushfire and built and ecological assets
- CFS state-wide preparedness campaigns, partnerships and community engagement programs, 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 Treatments 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 on Kangaroo Island, 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.

The investigation areas that have been selected by the BMC aim to complement current public land management mitigation activities, linking in with areas of existing lower fuel hazard levels to enhance the effectiveness of these treatments. 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 KI 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.

Please refer to [Appendix 1](#) for maps that display landscape risk treatments around settlements as well as several proposed Landscape Treatment Investigation Areas for the KI BMA.

5.2.2 Water Catchment Area Risk Treatments

Risk treatment strategies within the Middle River Reservoir Reserve are detailed in the Fire Management Plan for the site and include slashing, mechanical thinning/clearing and prescribed burning. Any proposed burning at this site or the larger catchment needs to be carefully planned and monitored to ensure no impact on water quality. Key mitigation measures would include avoidance of burning within creek lines, avoiding high intensity burns and, if required, installing erosion control structures immediately following a prescribed burn.

5.2.3 Softwood and Hardwood Plantations

Plantations of Softwood and Hardwood are scattered across the island and are considered at risk from bushfire. Maintenance and management of these areas is considered critical, to not only protect the surrounding assets or slow the spread of fire through the landscape but also to protect the plantations as economic assets. There are currently *Guidelines for Plantation Forestry in South Australia 2009* which outlines fire prevention and management strategies for plantation owners and managers.

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) is a fuel reduced area surrounding a built asset or structure, which is managed to minimize fuel loads, inhibit fire travel and reduce the effects of heat, flame, ember and smoke attack on the asset. Radiant heat is the most common cause of death during bushfires and affects people (health and decision making), animals and structures, whilst ember attack on properties is the leading cause of house loss during a bushfire. Introducing an APZ will provide separation between a bushfire hazard and the asset, minimising direct flame contact, reducing the effects of radiant heat and reducing ember attack. This may apply to a group of similar residential properties or along a boundary where the hazard exists, commercial or industrial asset or infrastructure. It may also be used within the boundary of a property to form part of a property's preparedness activities. The required separation distance between vegetation and asset for an APZ is specified in the SBCC APZ Standard which is based on the process defined in the *Australian Standard AS 3959* for building in bushfire prone areas. The distance required between the asset and the vegetation is to reduce the Bushfire Attack Level below 12.5 KW/M². Under the *Native Vegetation Act 1991*, property owners can generally reduce, modify or remove native vegetation within 20m of a building (including overhanging limbs). Significant trees may be protected in some council areas under the *Development Act 1993*.

5.3.3 Bushfire Buffer Zones

An area of managed or reduced bushfire fuel that acts as a Bushfire Buffer Zone (BBZ) aims to provide a buffer to reduce the spread, intensity, ember attack and potential spotting from a bushfire. The works associated with the establishment of a BBZ are focussed on selectively reducing the amount of fine fuel vegetation by means of mechanical removal or prescribed burning. These zones minimise continuous fuel structures between surface, near surface, elevated and canopy fuels.

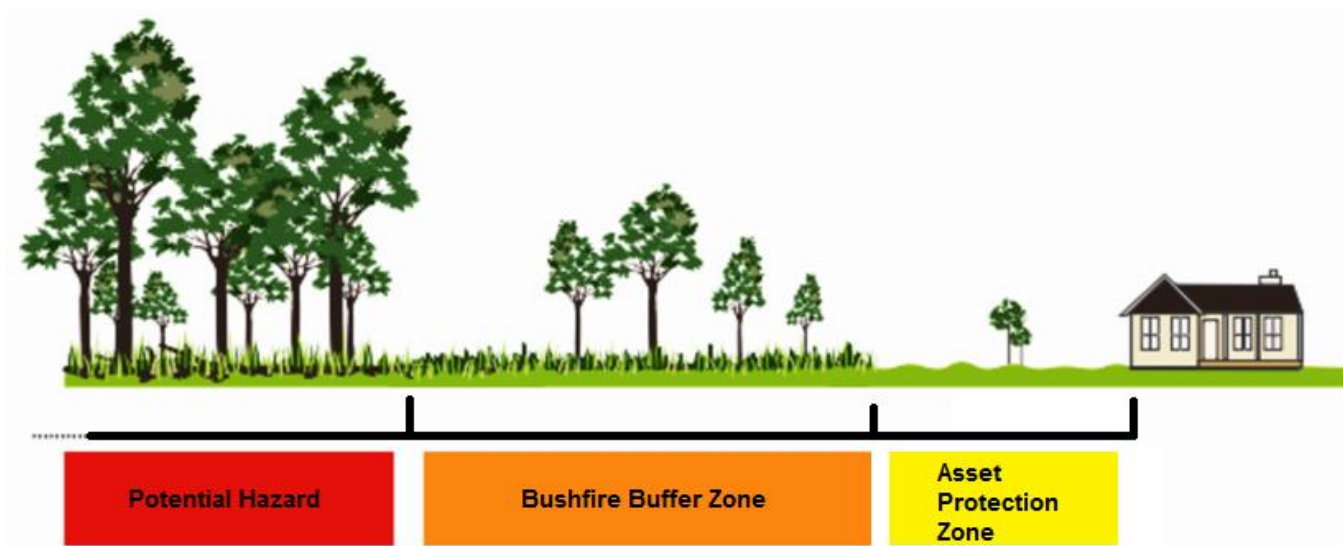


Figure 3: Asset and Bushfire Buffer Zones

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 and Regulations 2005*. Bushfire prevention activities undertaken by Fire Prevention Officer include:

- assessing the extent of bushfire hazards within the relevant council area;
- 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 necessary 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 a 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 have or require to manage the risk of bushfire impacting upon their site such as closing on catastrophic fire danger forecasts. This may involve agencies such as schools, health and community services and utilities which require planning and preparation to become bushfire ready.

5.4 Risk Treatment Implementation Plan

Once the KI BMAP has been approved by the SBCC, risk treatment implementation plans will be developed in conjunction with the BMC, council, 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:

- a. Risk and risk treatment identifiers
- b. Existing and proposed risk treatments
- c. Responsibility for risk treatment implementation
- d. Prioritisations of risk treatments
- e. Actions required to undertake risk treatments
- f. Timeframes for the completion of risk treatments
- g. Performance and success measures
- h. Reporting and monitoring procedures

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

6 MONITORING, REVIEWING AND REPORTING

6.1 Monitoring

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

The KI BMC is required to monitor the BMAP, the context and the risk 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 treatment works listed in the BMAP
- The timeliness of the works in the BMAP
- Compliance of risk treatment works with relevant Acts, Codes and Regulations. [Please 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 KI 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

KI 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 KI 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.

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 risks and risk treatments once the risk treatment works have been implemented, 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 KI 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 and Treatment Register* is available through the Bushfire Management Area Plans site:

<https://www.cfs.sa.gov.au/prepare-for-a-fire/bushfire-management-planning/bushfire-management-area-plans/>

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)
Kangaroo Island Bushfire Risk Management Plan (2009 – 2014)
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)
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)

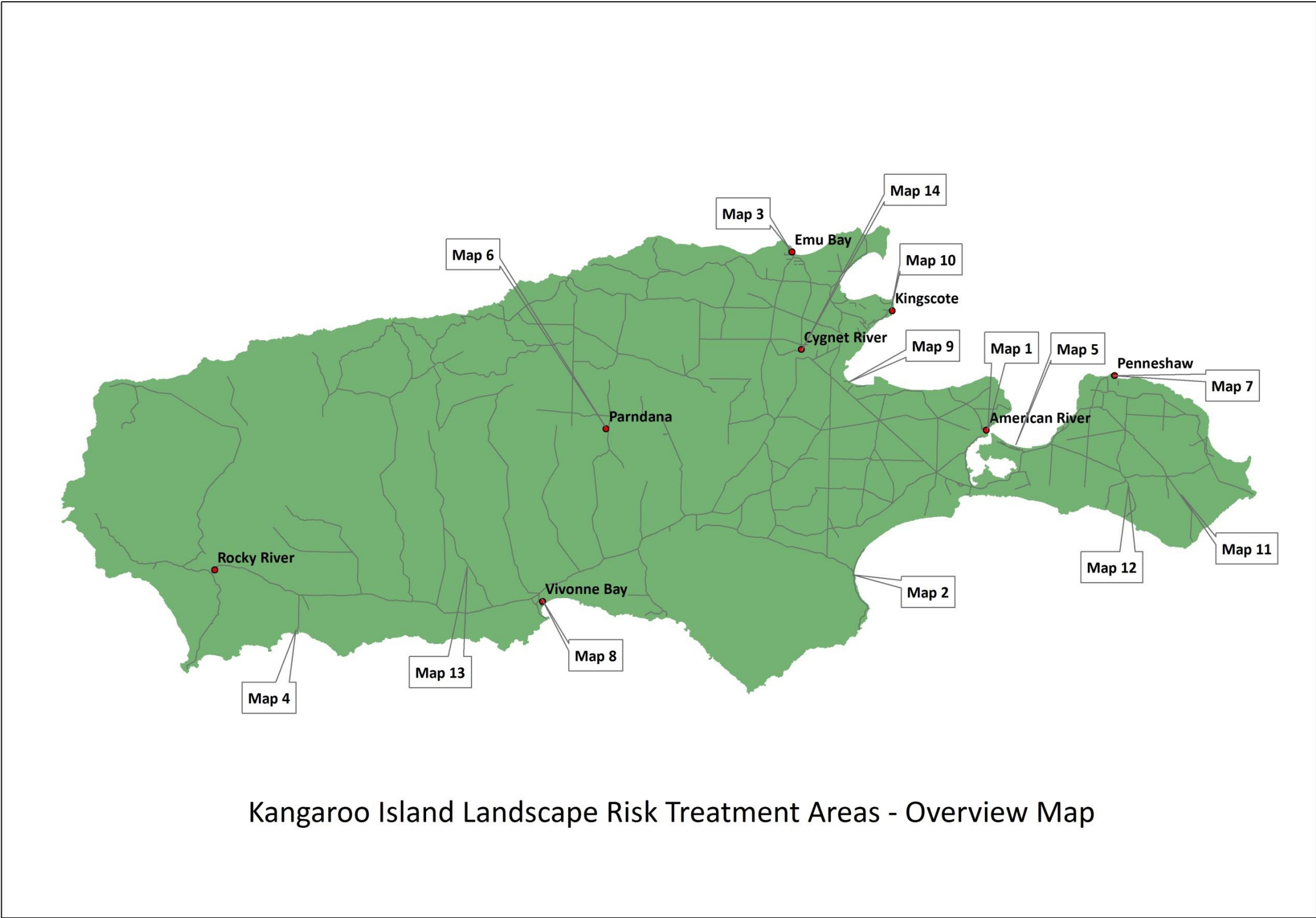
Definition and Acronyms

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
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 <i>Fire and Emergency Services Act 2005</i> 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
BBZ	Bushfire Buffer Zone
BMA	Bushfire Management Area (typically a Council's boundary) as proclaimed by the Governor under <i>Section 72 of the Fire and Emergency Services Act 2005</i> .
BMAP	Bushfire Management Area Plan as defined under <i>Section 73A of the Fire and Emergency Services Act 2005</i> .
BMC	Bushfire Management Committee as defined under <i>Section 72A of Fire and Emergency Services Act 2005</i> .
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 treatments, treatment owners and time frames for implementation and provides a framework for continuous review and monitoring of the risks and their 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 consequences 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.

Name	Description
DEWNR	Department of Environment, Water and Natural Resources
FBD	Fire Ban District
FDI	Fire Danger Index
FDR	Fire Danger Rating
FDS	Fire Danger Season
FES Act	Fire and Emergency Services Act 2005
FMP	Fire Management Plan – The plans that are produced by the Department of Environment, Water and Natural Resources for the management of their reserves and Crown lands for bushfire risk reduction works and ecological management.
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	2015 Government Agencies Fire Management Working Group
Impact	The loss, or damage, to an asset from a bushfire.
KI	Kangaroo Island
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 <i>Fire and Emergency Services Act 2005 Section 3</i> 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.
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 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.
SACFS (or CFS)	South Australian Country Fire Service
SAPOL	South Australian Police
SBCC	State Bushfire Coordination Committee
SBMP	State Bushfire Management Plan
ZEMP	Zone Emergency Management Plan

Appendix 1
Map1: Landscape Risk Treatment Areas

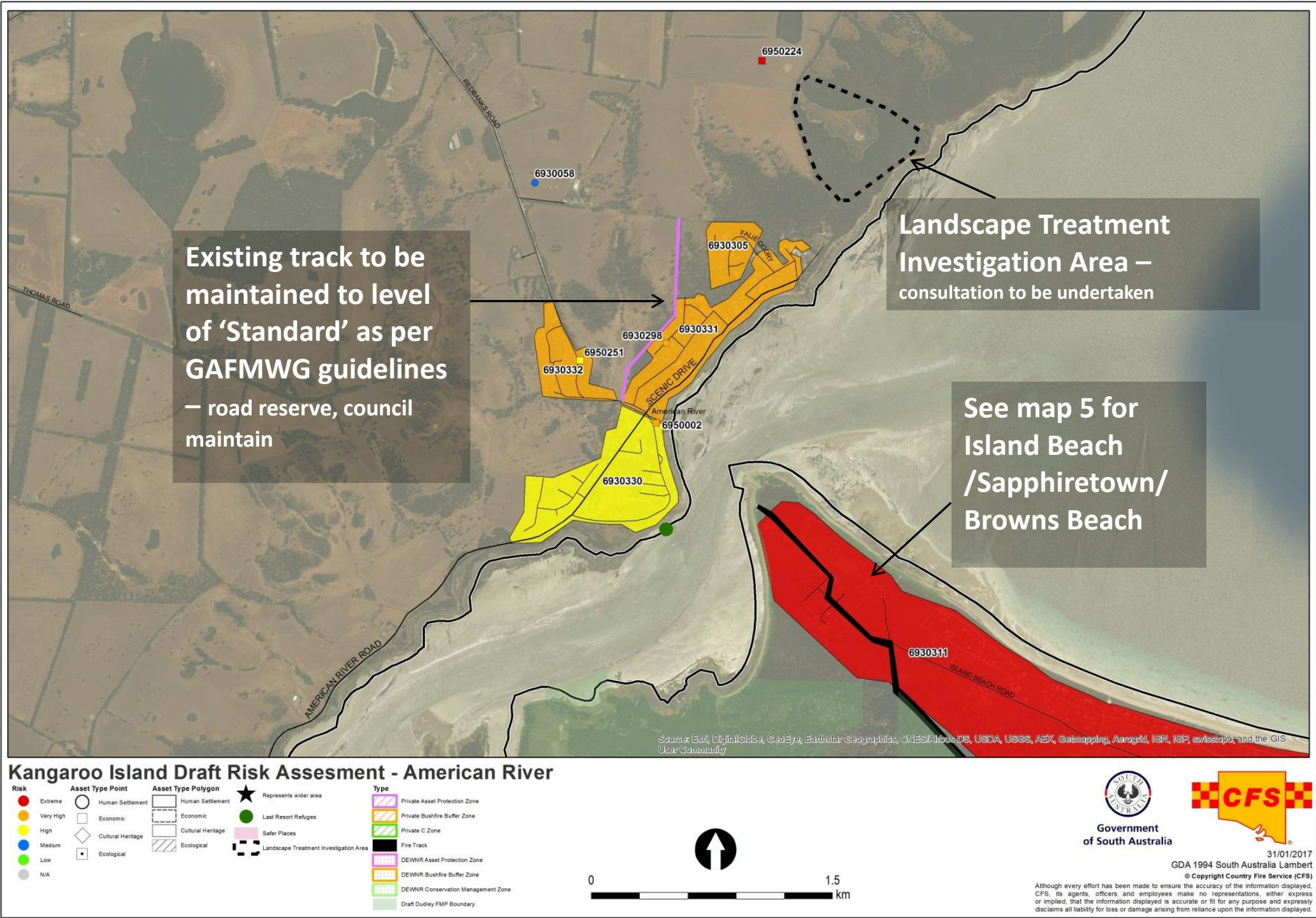
The below map provides an overview of areas across the island where landscape risk treatments have been identified. The inset maps, as well as a brief description of each map, can be found on the following pages:



Appendix 2
Map 1: American River

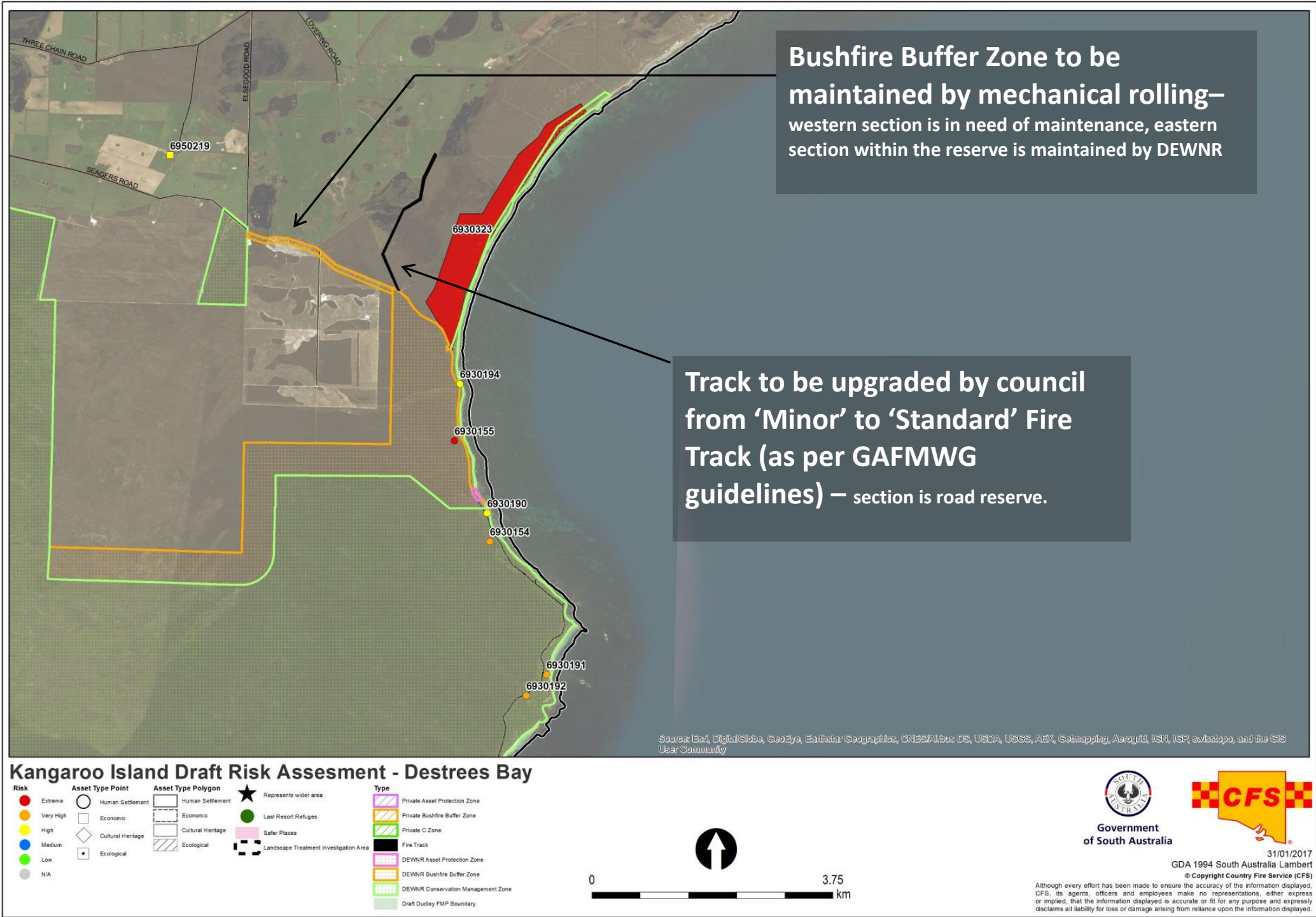
Parts of the main human settlement area of American River have a Very High risk rating. An existing fire access track to the NW of the town has been identified as strategically important to be maintained to the level of 'Standard' as per 5.1.2 of the South Australian Firebreaks, Fire Access track and Sign Standards Guidelines (GAFMWG). Council are to undertake any required work.

A landscape treatment investigation area has been identified to the NE of town as an area with some senescent vegetation and where the placement of strategic buffer zone(s) may provide some protection to the township. Consultation with landholders is to be undertaken.



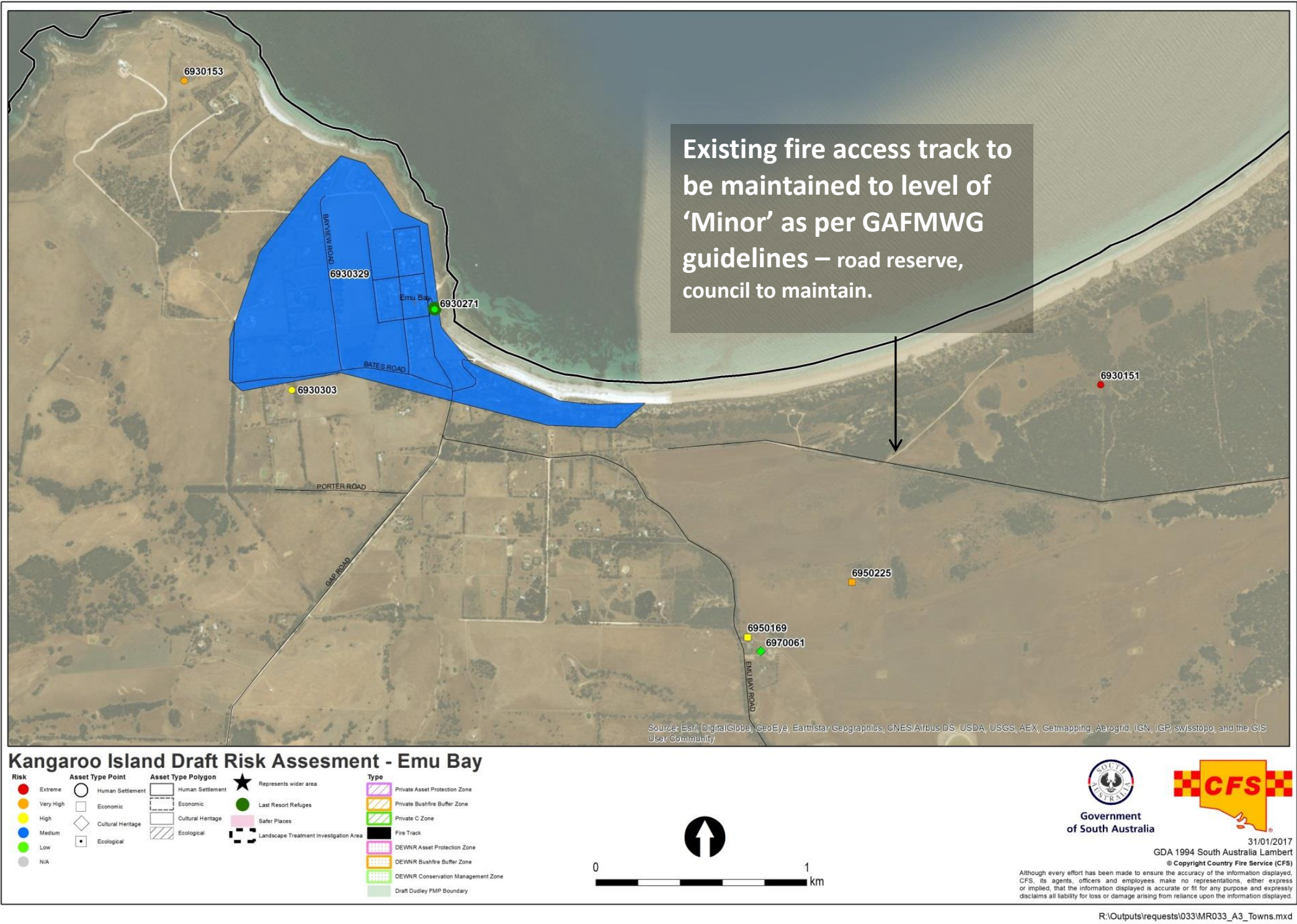
Map 2: D’Estrees Bay

The residences within this area are at Extreme risk due to their proximity to vegetation. The risk treatment measures identified include the maintenance of an existing Bushfire Buffer Zone (by mechanical rolling) along the roadside and an upgrade to an existing Fire Access Track to include turn around bays. The western section of the BBZ is currently maintained by DEWNR and the eastern section is to be maintained by council. This would upgrade the track from a ‘Minor’ to a ‘Standard’ GAFMWG fire access track. The fire access track is road reserve and the work is to be undertaken by council.



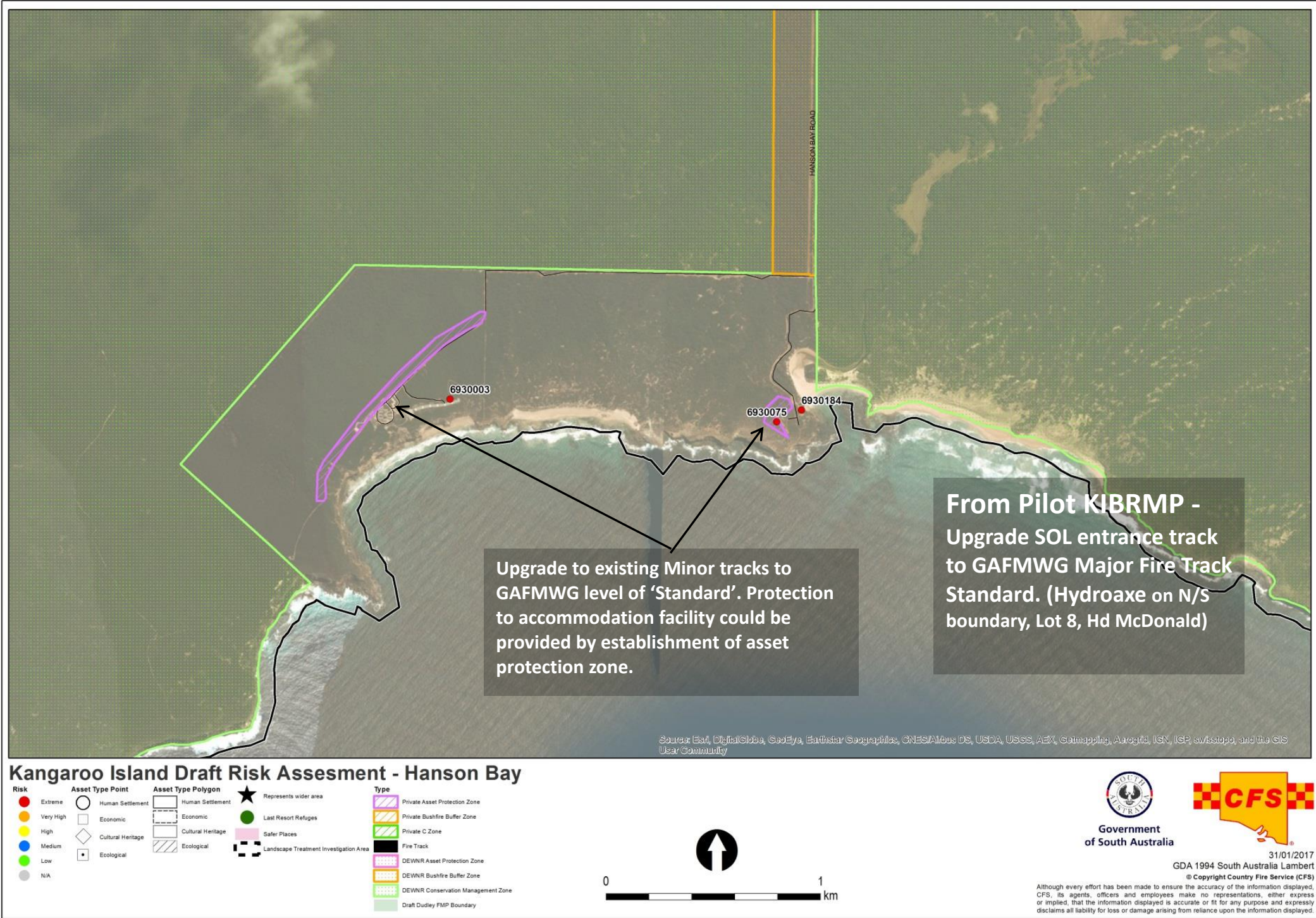
Map 3: Emu Bay

A landscape risk treatment measure for this area is the maintenance of an existing fire access track (known as Wallaby Run) to a GAFMWG standard of Minor. Council maintain this track.



Map 4: Hanson Bay

Landscape risk treatment strategies that were identified in the Pilot KIBRMP were reviewed by the BMC and are still considered necessary to be either maintained and/or implemented to provide a level of protection to the accommodation facilities within this area. These strategies include maintenance/upgrading of fire access tracks and the establishment of Asset Protection Zones around accommodation facilities.



Map 5: Island Beach/Sapphiretown/Browns Beach/Baudin Beach

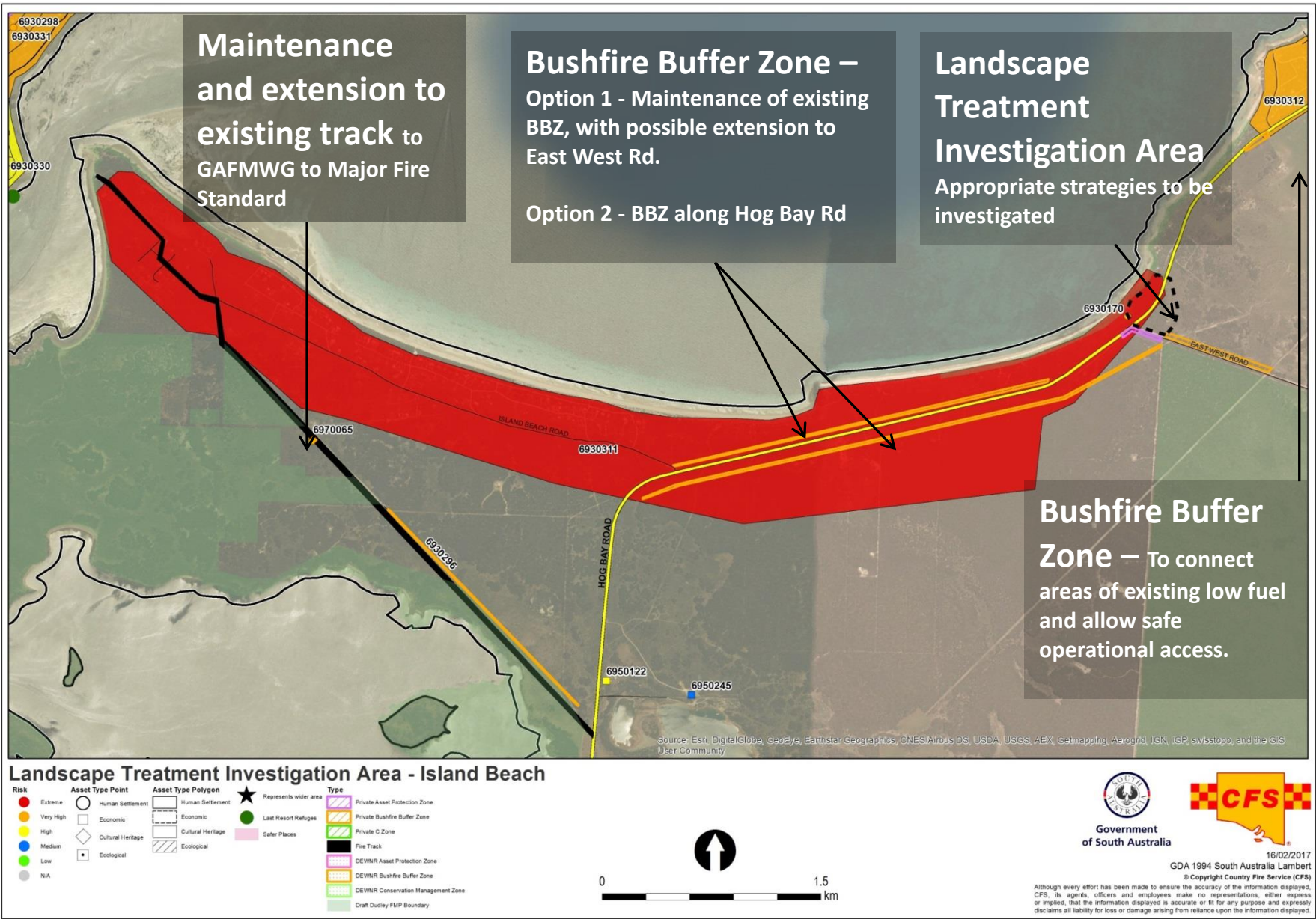
The residences within this area are at Extreme risk due to their proximity to vegetation. The assets in and around Island Beach, Sapphiretown and Browns Beach have been rated, unsurprisingly, as an Extreme Risk due to their proximity to vegetation. Landscape risk treatment strategies that were identified in the Pilot KIBRMP were reviewed by the BMC and have been identified as needing to be maintained, modified or implemented to provide a level of protection to the assets within this area.

The current fire access track along Mitchell Drive is to be maintained to a GAFMWG Major Fire Access Track, it is proposed to extend this track to enable safe operational access through to Sapphiretown.

A Landscape Treatment Investigation area at the entrance to Hog Bay Road has been identified. This land is managed by council and DPTI. The purpose of investigating strategies in this area would be to provide protection to Browns Beach Campground (asset id 6930170 Risk Rating Very High) and also to the human settlement area of Baudin Beach (asset id 6930312 Risk Rating Very High). Another option is a BBZ in the area along Hog Bay Rd (aka the Mad Mile). There are two options in this area and which is implemented will be dependent on agreement with the landholders in the area.

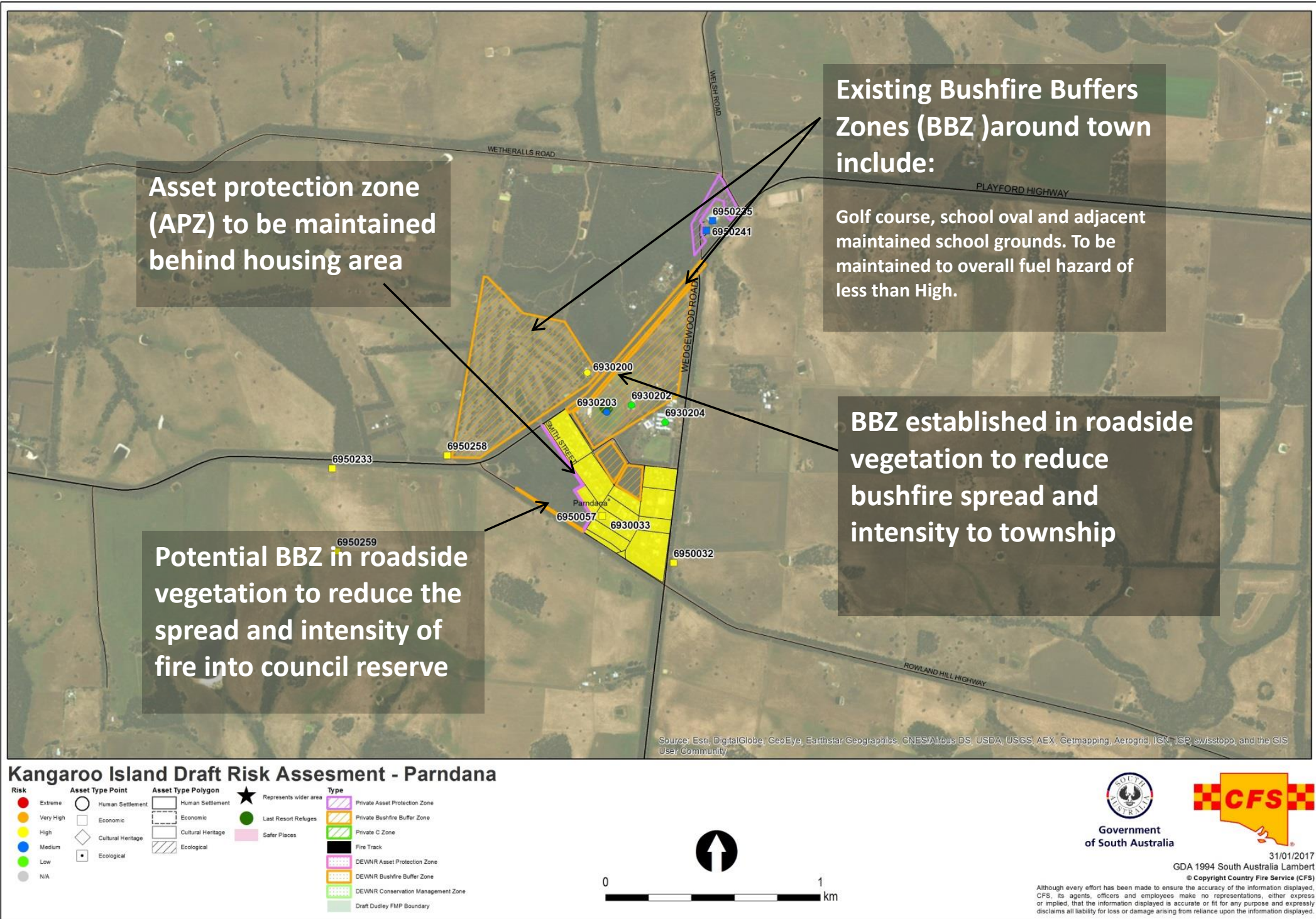
Option 1 is the maintenance of a break that runs parallel to Hog Bay Road. To be most effective it would be useful to extend this break to the East West Road. This is dependent on the agreement of the landholders through this area.

Option 2 is the establishment of a BBZ in the council road reserve that runs along Hog Bay Road. A potential Bushfire Buffer Zone adjacent to the road entering Baudin Beach has been identified. The purpose would be to connect up existing areas of low fuel and allow safe operational access to the settlement.



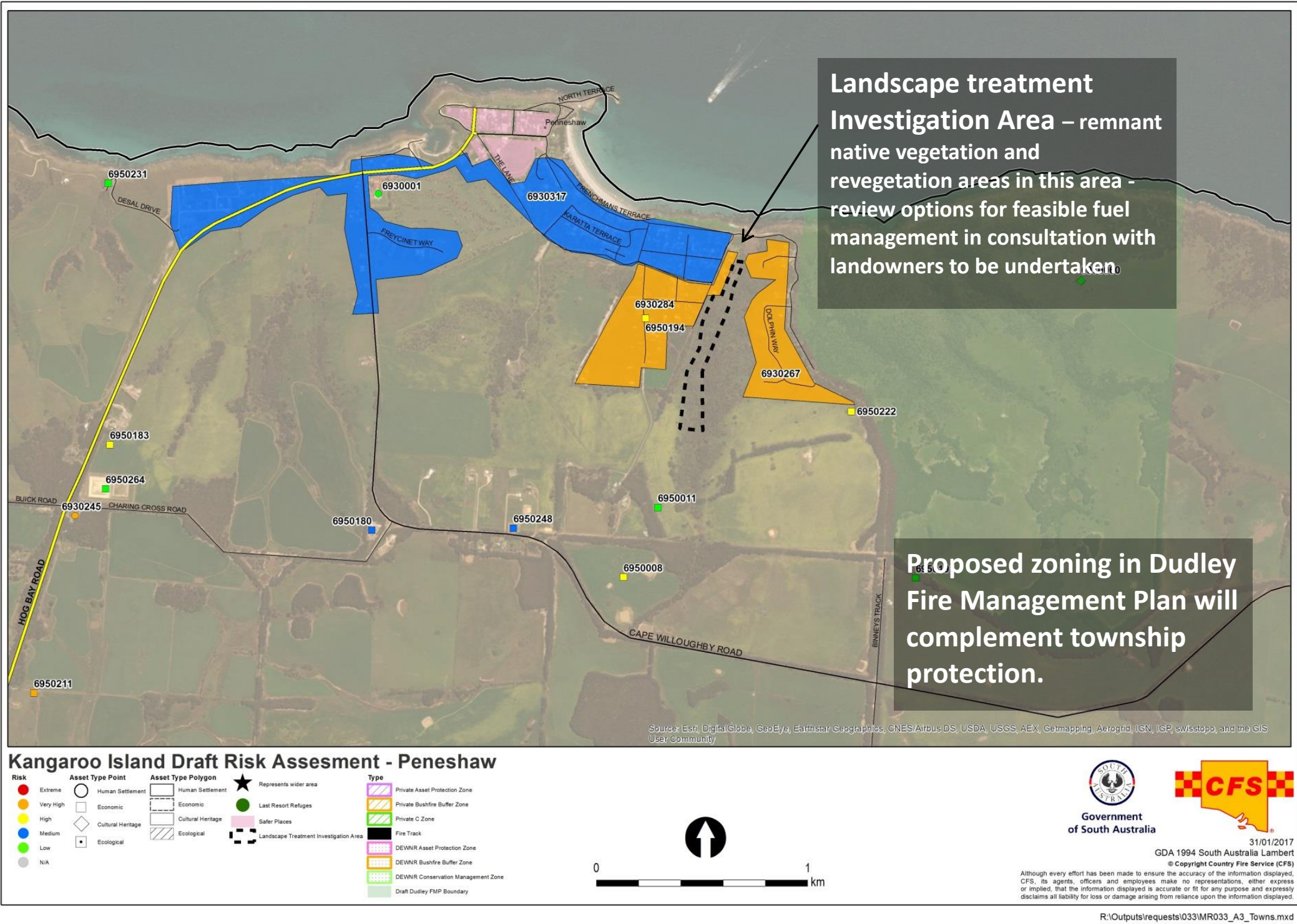
Map 6: Parndana

Several landscape risk treatment measures were identified for Parndana as part of the Pilot KIBRMP. Some were implemented and others were not due to resourcing or other barriers. Several areas of existing low fuel (i.e. Parndana golf course, school grounds) currently qualify as Bushfire Buffer Zones. These areas have been identified in the BMAP and, should there be a change to land use, alternative strategies are to be investigated by the BMC. To complement these existing low fuel zones a BBZ is proposed to be implemented in the roadside vegetation opposite the council reserve to reduce the spread and intensity of fire should it approach from the SW. Also identified was the need to maintain an Asset Protection Zone in the reserve opposite Smith St and behind the CFS station. This is maintained by council. Also identified, to provide protection from a fire approaching from the north, is a Buffer Zone to complement the reduced fuel zone of the school. This would occur in the roadside vegetation adjacent to housing along the Playford Highway.



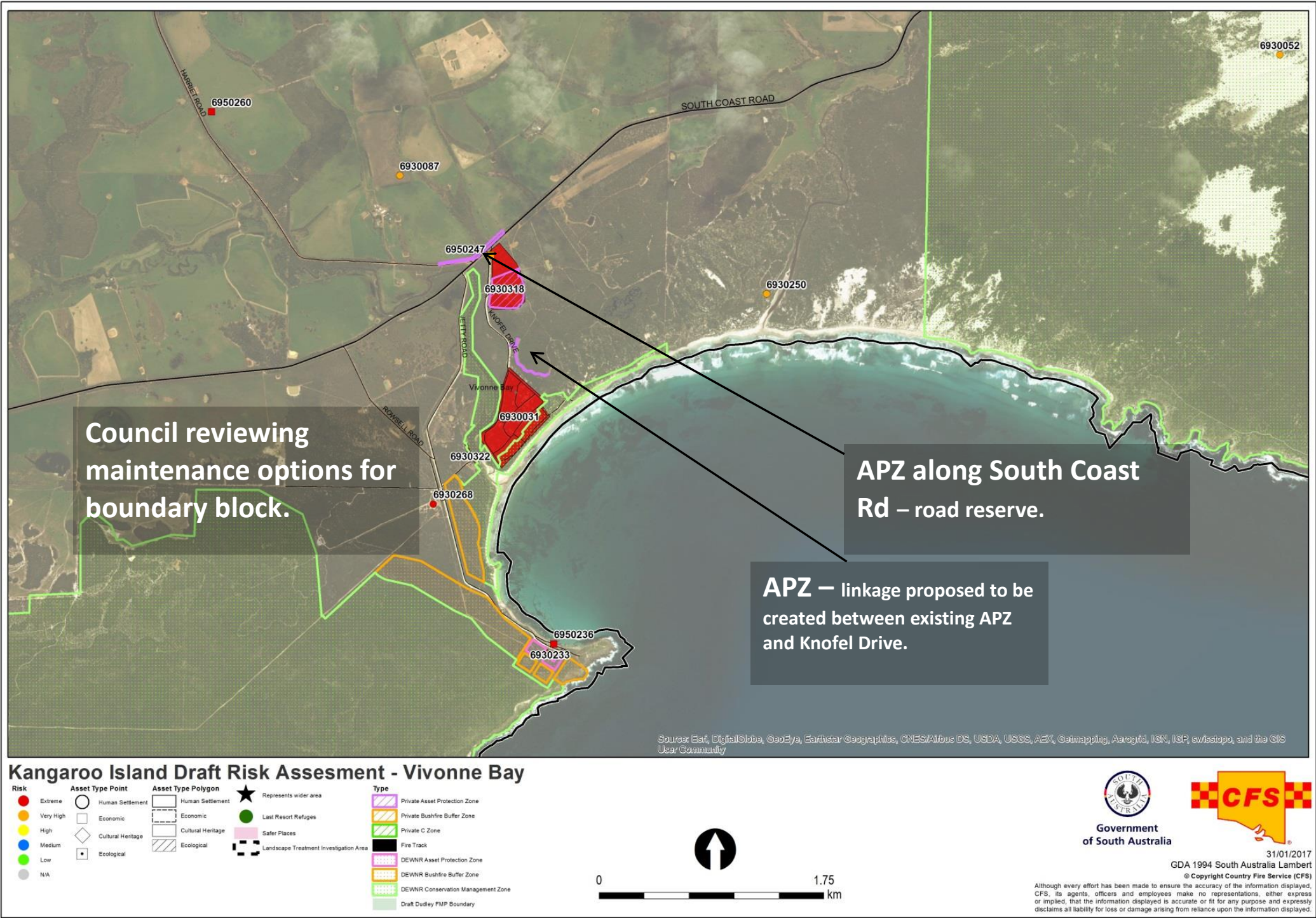
Map 7: Penneshaw

There are large areas of public land to the east of Penneshaw which are managed by DEWNR. Landscape risk treatment measures on this land have been identified by DEWNR and will form part of the Dudley Fire Management Plan (currently in preparation). Landscape risk treatment strategies on private land aim to complement the zones identified in the Dudley Plan. These strategies include the maintenance of the Standard Fire Access Track at Trethewey Terrace. It is also proposed to upgrade Binney’s track to a Major Fire Access track however the feasibility of completing this may be difficult due to terrain.



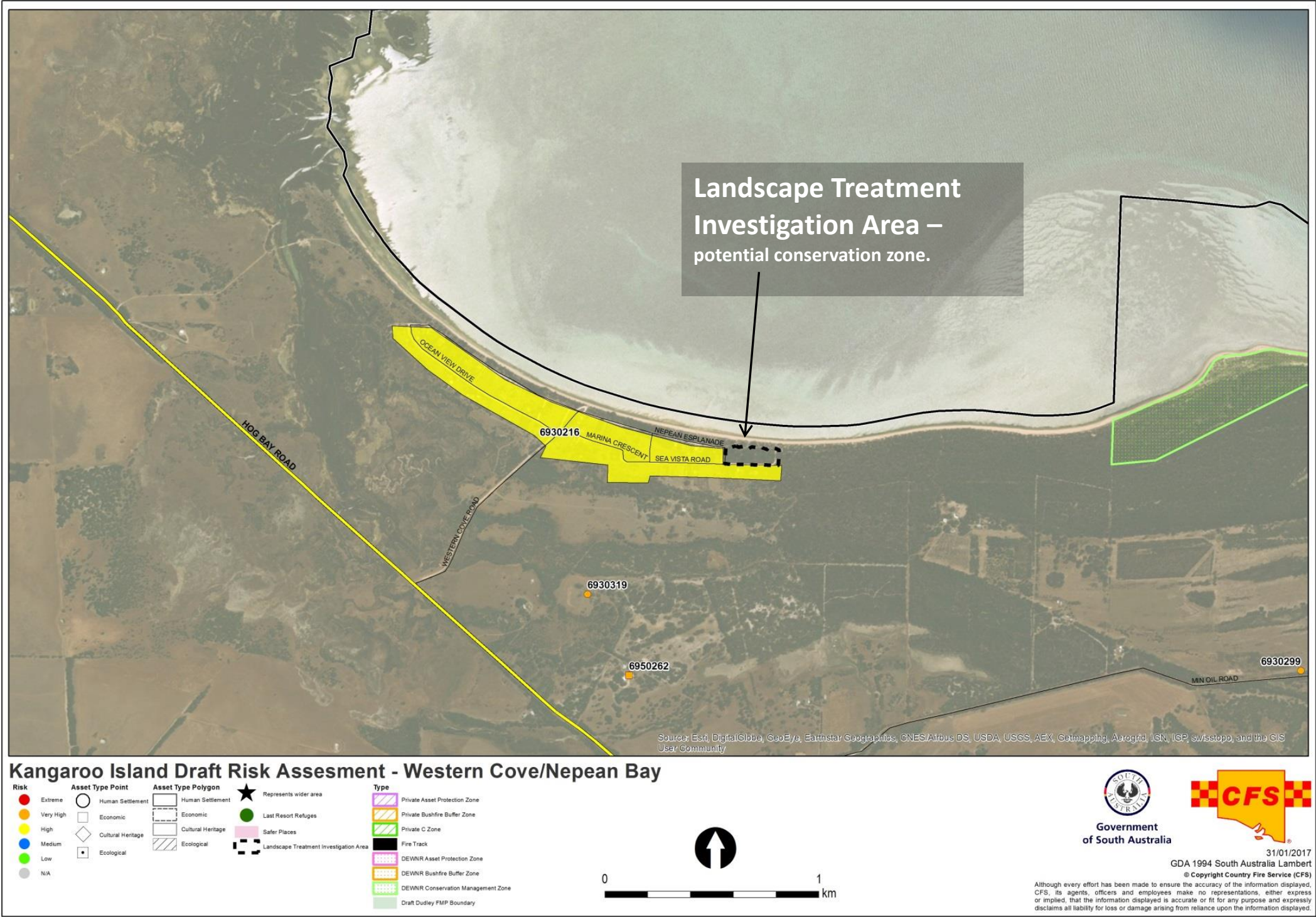
Map 8: Vivonne Bay/Point Ellen

The assets in and around Vivonne Bay and Point Ellen have been rated, unsurprisingly, as at Extreme Risk due to their proximity to vegetation. Landscape risk treatment strategies that were identified in the Pilot KIBRMP were reviewed by the BMC and have been identified as needing to be maintained, modified or implemented to provide a level of protection to the assets within this area. These strategies include establishment of an Asset Protection Zone adjacent to the Vivonne Bay Tourist Area (asset id 6930318) in the form of vegetation management in the roadside vegetation along South Coast Road. This would occur in the road reserve and be undertaken by council. An APZ in the form of a fire access track is currently in place just to the north of the main human settlement area (asset id 6930031). A linkage is to be implemented between this track and Knofel Drive. Council are investigating options to be implemented within the council reserve located in the area identified by asset id 6930031. These options aim to complement the land management strategies on public land identified in the Cape Gantheaume Fire Management Plan.



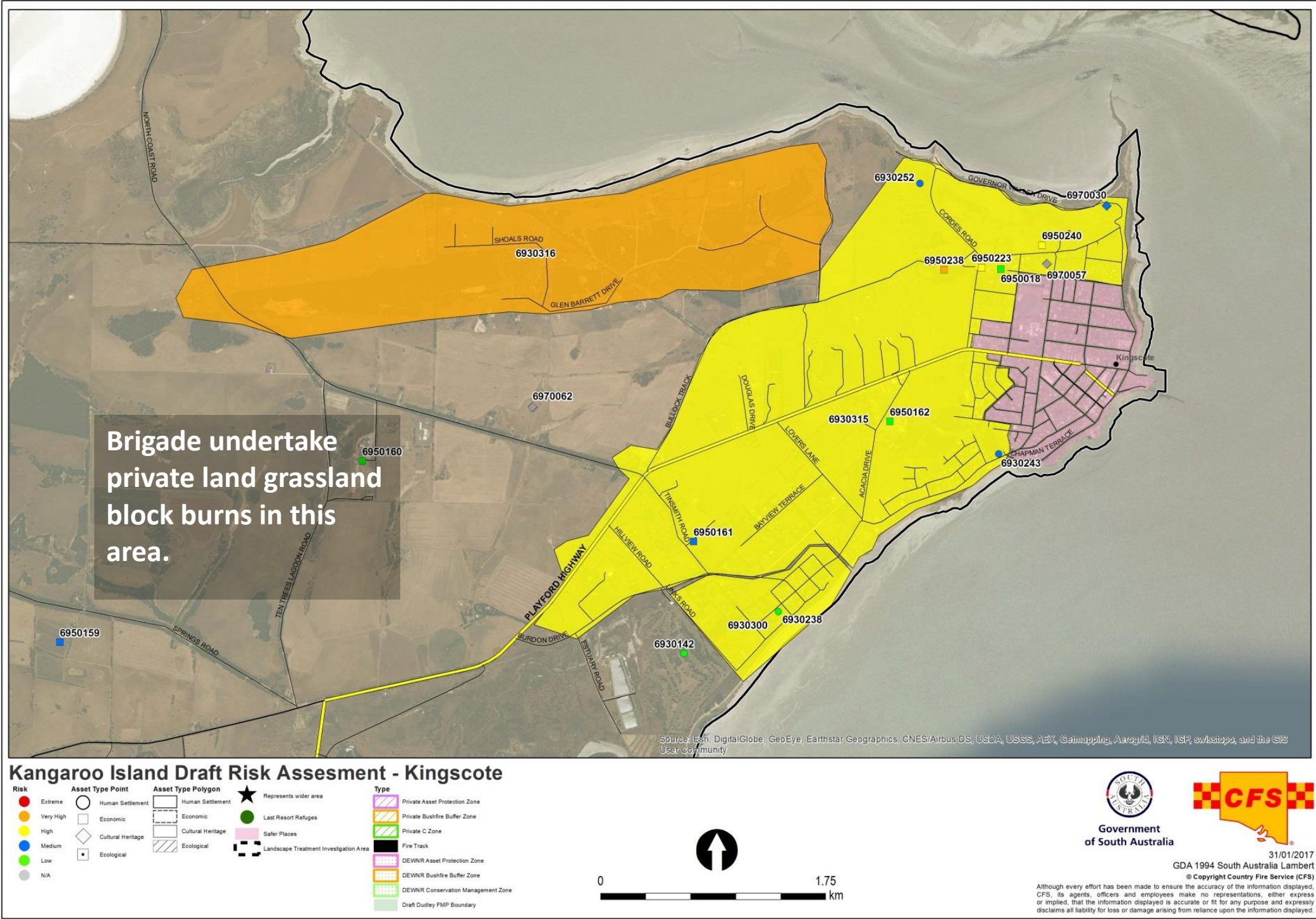
Map 9: Western Cove/Nepean Bay

An area of scrub to the east of the housing area (asset id 6930216) has been identified as a Landscape Treatment Investigation Area. Potentially this area may be categorised as a C-zone and appropriate strategies investigated that will aim to protect the senescing vegetation.



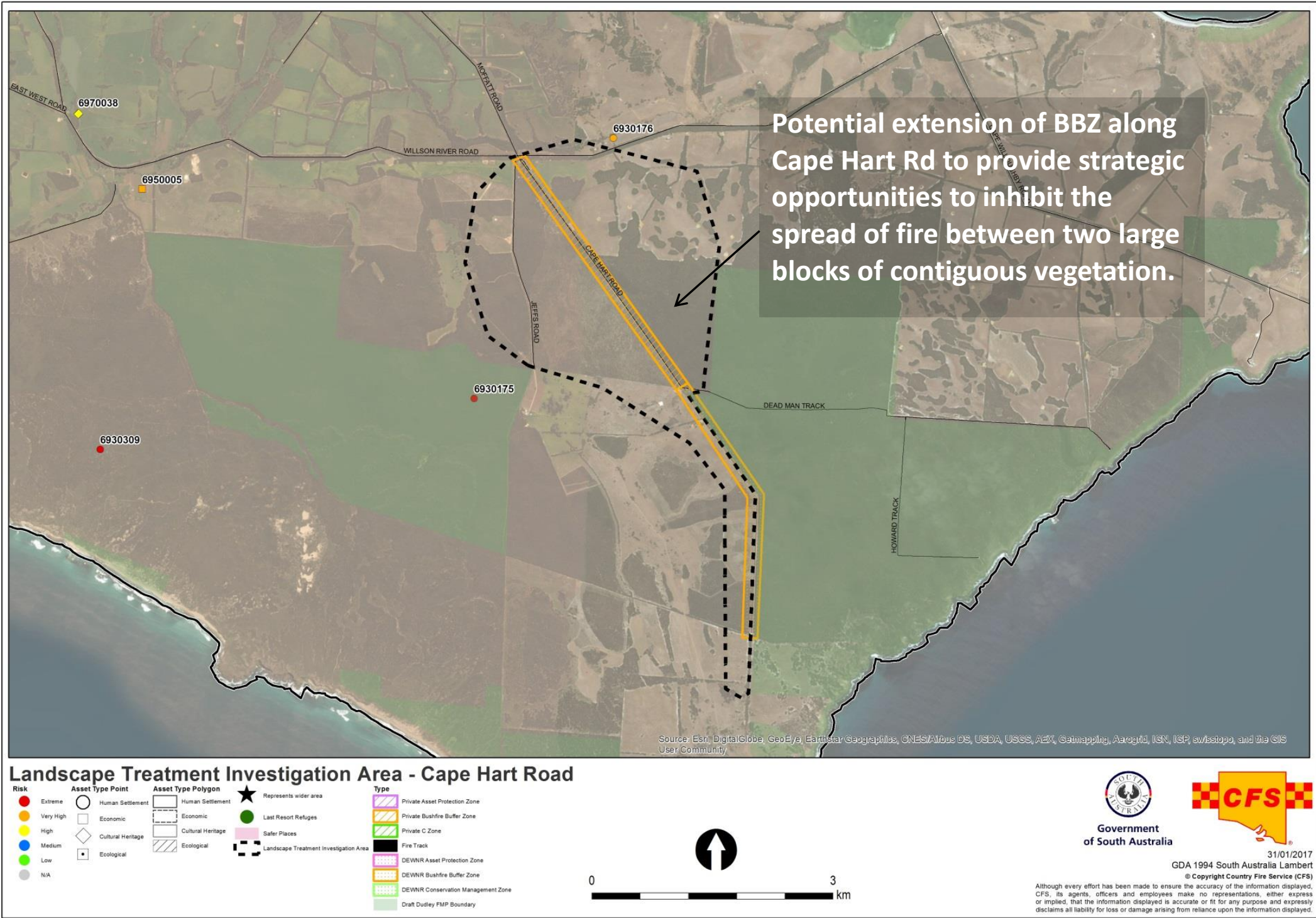
Map 10: Kingscote/Dover Farm/Brownlow

Though the suppression capability in this area is greater than for other parts of the island there is still a risk of a fire approaching through grassland from the west. The local Kingscote CFS brigade undertakes grassland block burns in this area. However should this not occur due to weather or resourcing restraints alternative landscape risk treatment strategies will be investigated by the BMC.



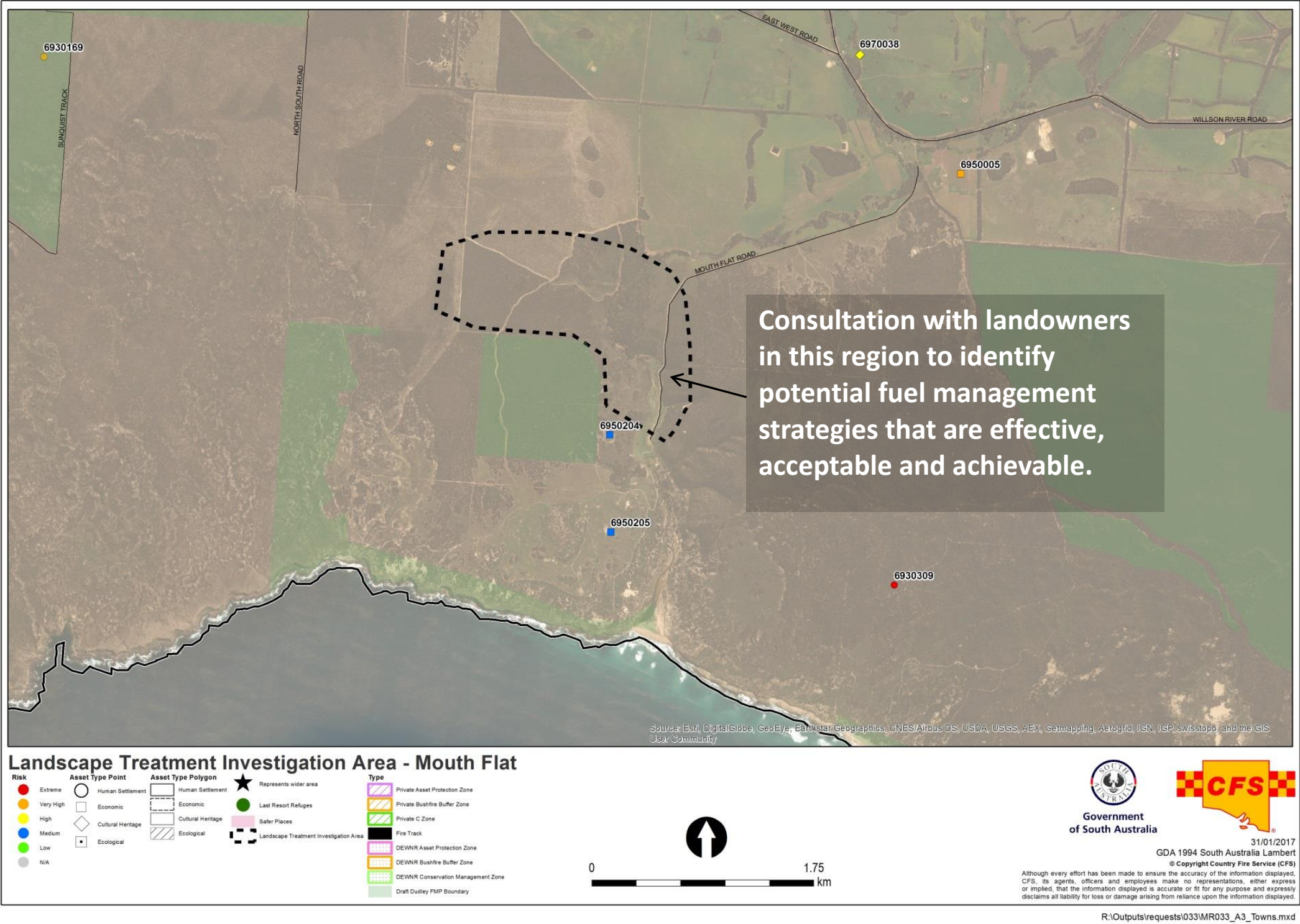
Map 11: Cape Hart Road

This area has been identified by the BMC as a location to investigate landscape risk treatment strategies that will connect low fuel areas to the north and south. The aim of this work would be to inhibit the spread of fire between two large blocks of contiguous vegetation. DEWNR currently maintain a 17m roadside break (from Pilot KIBRMP) along the southerly section of Cape Hart Road. Consultation with landholders will need to occur to see if this treatment can be extended along the northern section of Cape Hart Road.



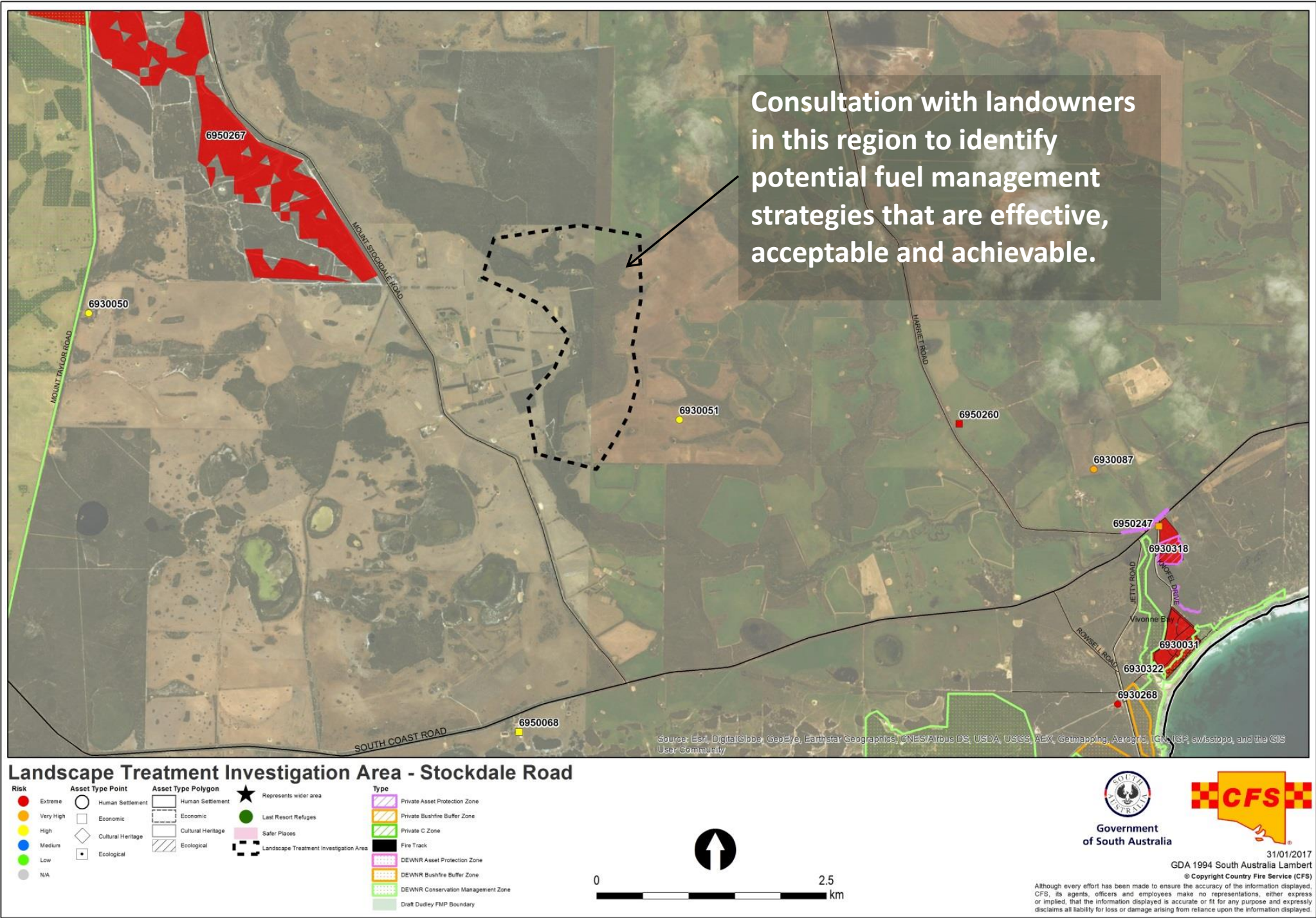
Map 12: Mouth Flat

This area has been identified as a Landscape Treatment Investigation Area to look at options to complement the fire management activities on public land to prevent or inhibit the spread of fire between areas of vegetation. Council have undertaken some roadside vegetation management in this area. Consultation with landholders is to be undertaken.



Map 13: Mount Stockdale

This area has been identified as a Landscape Treatment Investigation Area to look at options to complement the fire management activities on public land to prevent or inhibit the spread of fire through a stretch of native vegetation. Fire management activities within this area could additionally provide strategic protection for the human settlement areas in and around Vivonne Bay. Consultation with landholders is to be undertaken.



Map 14: Cygnet River

The property owners in this area maintain parcels of land to the standard of Bushfire Buffer Zones. These blocks have been identified as existing BBZs and should there be changes to the land use the BMC will consider alternative risk treatment strategies.

