

Kevin Hazell

BUSHFIRE PLANNING

Bushfire assessment to inform the Yarragon Township Plan

FINAL REPORT

19 September 2022

Version 1.0

Prepared for:

Baw Baw Shire Council

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About

Kevin Hazell Bushfire Planning is a town planning service that works with public and private sector clients to understand and apply planning scheme bushfire policies and requirements. It is led by Kevin Hazell who is a qualified town planner with extensive experience working on bushfire planning at State and local levels in Victoria.

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Disclaimer

The views expressed in this report are those of the author. Information in this document is current at the time of writing. While all professional care has been undertaken in preparing the document, the author accepts no liability for loss or damages incurred because of reliance placed upon its content.

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Version Control

Version	Date	Comment	Name
v0.1	8 September 2022	Working Draft Report	Kevin Hazell Town Planner
v1.0	19 September 2022	Final Report	Kevin Hazell Town Planner

1. Introduction

Kevin Hazell Bushfire Planning has been engaged by Baw Baw Shire Council (the 'Council') to prepare a bushfire assessment to inform the Yarragon Township Plan (the 'Township Plan').

1.1 The Township Plan

The Council describes the Township Plan as follows:

The Yarragon Township Plan will provide a long-term strategic vision for Yarragon. The Plan will consider land uses, township character, connectivity, natural environment and the public realm. It will also include an Urban Design Framework to guide development in the town centre, acknowledging the established 'village' feel.

The Plan will provide a clear planning framework that addresses opportunities and constraints and will make recommendations for guidance on decision making about investments, infrastructure improvements and development proposals.

Once completed, the Plan will also be used as a basis for formal changes to the Baw Baw planning Scheme, through revised planning controls.

At the time of writing this report, SMEC Consultants have been appointed to prepare the Yarragon Township Plan.

1.2 About Yarragon

The Yarragon Township Plan Background Report (March 2022) describes the area as follows:

Yarragon is a charming Gippsland town which is located approximately 120km east of Melbourne. It is positioned between neighbouring towns Warragul and Trafalgar and at the foothills of the Strzelecki ranges.

It is one of the major towns along the Princes Highway in the region, including Drouin, Warragul, Trafalgar, Moe, Morwell, Traralgon and others. It is also the fourth largest urban area in the Baw Baw Shire local government area (LGA).

Yarragon is surrounded by productive agricultural land. Formerly known as Waterloo, the main economic driver of the town was tree logging and later dairy farming. In the mid 1980's the town tapped into its heritage and location and focused on tourism.

1.3 The Study Area

The Study Area was provided as part of the scope of work and comprises the existing settlement and Farming Zone land adjoining the settlement.

See **Figure 1A: Locality map with Study Area**

See **Figure 1B: Locality aerial photo with Study Area**

See **Figure 1C: Zones**

See **Figure 1D: Bushfire Management Overlay and Bushfire Prone Areas**

1.4 Methodology

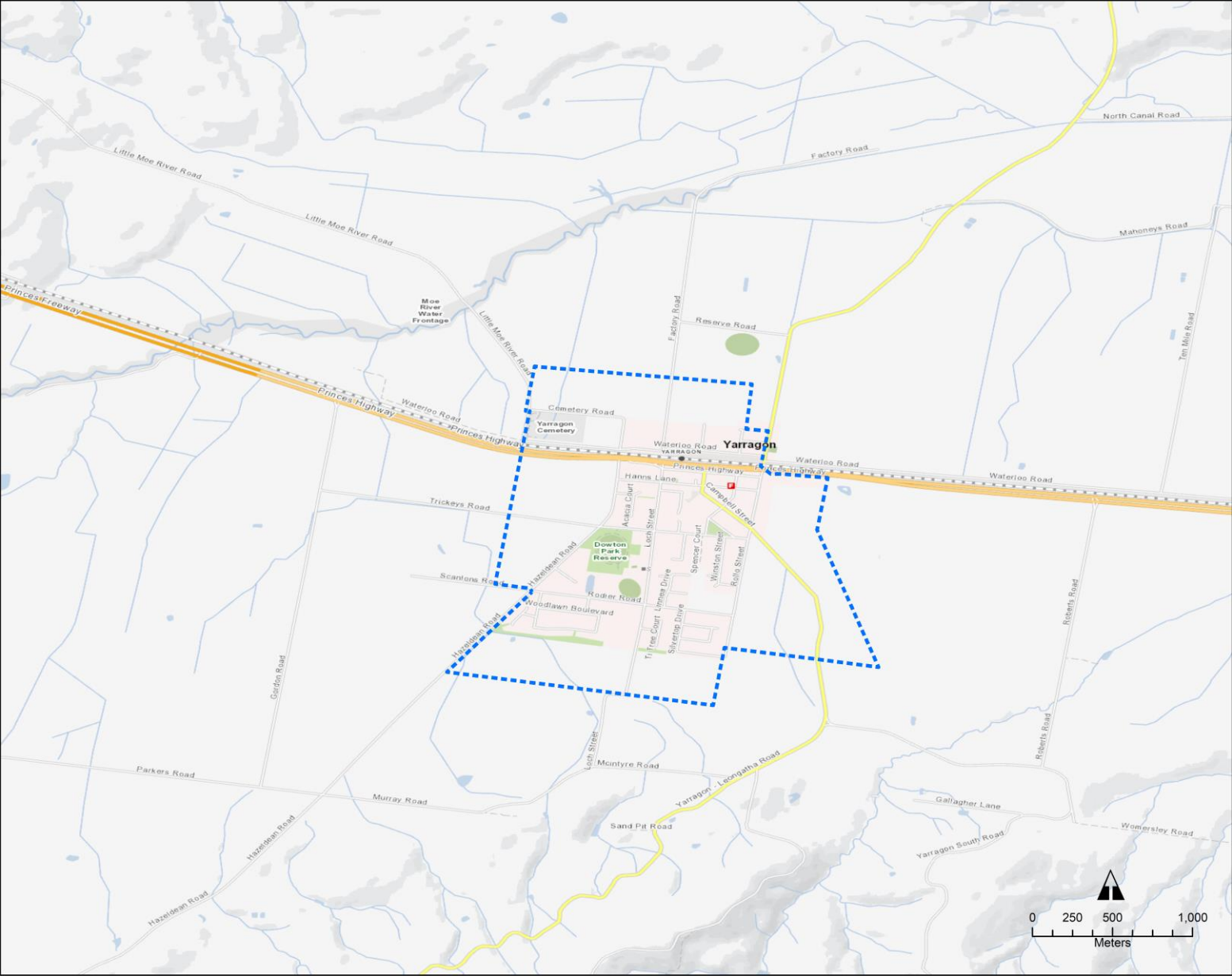
c13.02-1S Bushfire Planning includes strategies that inform how bushfire hazards are to be assessed and for considering where and how growth and new development should occur. Having regard to these strategies, this report responds to the scope of work as follows:

- Section 2 provides an overview of bushfire content in the planning scheme, including the strategies in *c13.02-1S Bushfire Planning*.
- Section 3 describes the bushfire context using a range of information sources, mostly arising from the work of public authorities such as fire authorities and the Council.
- Section 4 describes landscape bushfire hazards that may influence the locality, similar to a bushfire hazard landscape assessment described in *Planning Permit Applications Bushfire Management Overlay Technical Guide* (DELWP 2017). This includes the identification of landscape types that help understand the relative risk between different places.
- Section 5 describes the bushfire hazard at the neighbourhood and local scale. This is informed by the methodology for a bushfire hazard site assessment as described in *Planning Permit Applications Bushfire Management Overlay Technical Guide* (DELWP 2017) and *AS3959-2018 Construction of buildings in bushfire-prone areas* (Standards Australia).
- Section 6 includes a discussion and recommendations. The objectives and strategies in *c13.02-1S Bushfire Planning* are used to inform the recommendations.
- Section 7 includes a summary of the recommendations.

1.5 A note about the bushfire assessments in this report

The bushfire assessments have been prepared to inform decision making associated with strategic planning and the strategic application of *c13.02-1S Bushfire Planning*. The bushfire assessments do not consider bushfire for the purpose of individual planning applications.

FIGURE 1A: LOCALITY MAP



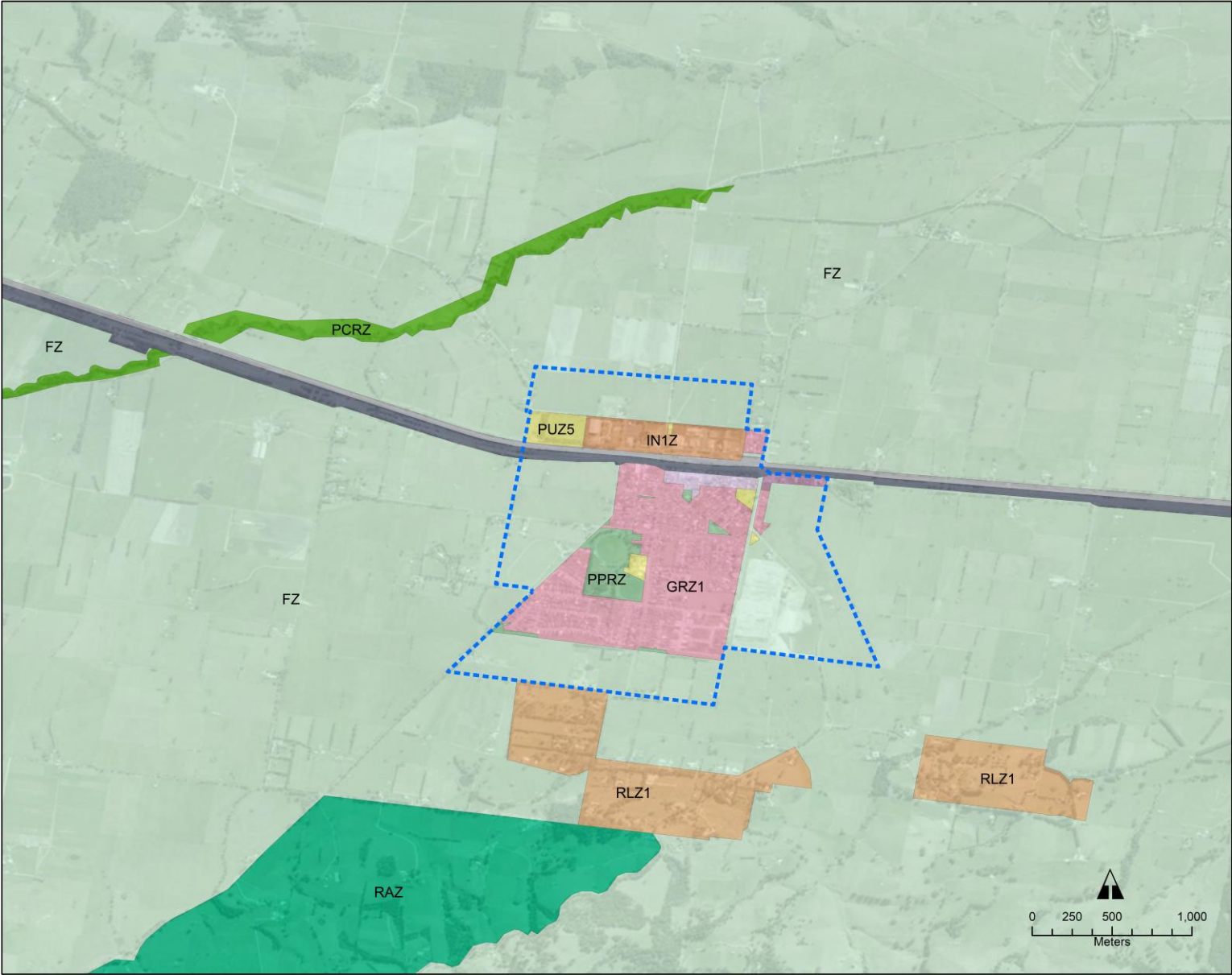
Study Area

FIGURE 1B: LOCALITY AERIAL PHOTO



 Study Area

FIGURE 1C: ZONES



Study Area

FIGURE 1D: BUSHFIRE MANAGEMENT OVERLAY



FIGURE 1E: BUSHFIRE PRONE AREA



2. Planning scheme bushfire context

The planning scheme contains provisions that inform permit requirements, application requirements and policies & decision guidelines where the bushfire hazard could be an influence on future land use and development. This section provides an overview of these provisions. Figure 2 summarises the considerations.

2.1 Integrated decision making (c71.02-3)

c71.02-3 requires planning authorities, in bushfire areas:

[T]o prioritise the protection of human life over all other policy considerations.

Bushfire considerations are not to be balanced in favour of net-community benefit, as occurs for all other planning scheme matters. The bushfire emphasis in c71.02-3 was introduced through Amendment VC140 in December 2017. Such policy settings were recommended in 2011 by the *2009 Victorian Bushfires Royal Commission*.

2.2 Natural hazards and climate change (c13.01-1S)

The objective of the State natural hazards and climate change policy is:

To minimise the impacts of natural hazards and adapt to the impacts of climate change through risk-based planning.

c13.01-1S *Natural hazards and climate change* contains a series of strategies to meet the above objective:

- Respond to the risks associated with climate change in planning and management decision making processes.
- Identify at risk areas using the best available data and climate change science.
- Integrate strategic land use planning with emergency management decision making.
- Direct population growth and development to low risk locations.
- Develop adaptation response strategies for existing settlements in risk areas to accommodate change over time.
- Ensure planning controls allow for risk mitigation and climate adaptation strategies to be implemented.
- Site and design development to minimise risk to life, property, the natural environment and community infrastructure from natural hazards.

2.3 State planning policy for bushfire (c13.02-1S)

The objective of the State planning policy for bushfire is:

To strengthen the resilience of settlements and communities to bushfire through risk-based planning that prioritises the protection of human life.

The key strategy that directs bushfire decision making is:

Give priority to the protection of human life by:

- *Prioritising the protection of human life over all other policy considerations.*
- *Directing population growth and development to low risk locations and ensuring the availability of, and safe access to, areas where human life can be better protected from the effects of bushfire.*
- *Reducing the vulnerability of communities to bushfire through the consideration of bushfire risk in decision making at all stages of the planning process.*

c13.02-1S *Bushfire Planning* applies to all planning and decision making relating to land:

- *Within a designated bushfire prone area;*
- *Subject to a Bushfire Management Overlay; or*
- *Proposed to be used or developed in a way that may create a bushfire hazard.*

c13.02-1S *Bushfire Planning* contains a series of strategies and these are summarised below.

Landscape bushfire considerations

c13.02-1S *Bushfire Planning* requires a tiered approach to assessing the hazard:

- *Considering and assessing the bushfire hazard on the basis of [...] landscape conditions - meaning the conditions in the landscape within 20 kilometres and potentially up to 75 kilometres from a site;*
- *Assessing and addressing the bushfire hazard posed to the settlement and the likely bushfire behaviour it will produce at a landscape, settlement, local, neighbourhood and site scale, including the potential for neighbourhood-scale destruction.*

Alternative locations for development

c13.02-1S *Bushfire Planning* includes two strategies that seek to direct new development:

- *Give priority to the protection of human life by [...] directing population growth and development to low risk locations [.]*
- *Assessing alternative low risk locations for settlement growth on a regional, municipal, settlement, local and neighbourhood basis.*

Availability and safe access to areas of enhanced protection

c13.02-1S *Bushfire Planning* requires a location in easy reach that provides better protection for life from the harmful effects of bushfire:

- *Ensuring the availability of, and safe access to, areas assessed as a BAL-LOW rating under AS3959-2018 Construction of buildings in bushfire-prone areas (Standards Australia) where human life can be better protected from the effects of bushfire.*
- *Directing population growth and development to low risk locations and ensuring the availability of, and safe access to, areas where human life can be better protected from the effects of bushfire.*

The views of the relevant fire authority

c13.02-1S *Bushfire Planning* identifies that a key element of a risk assessment is to:

- *Consult [...] with [...] the relevant fire authority early in the process to receive their recommendations and implement appropriate bushfire protection measures.*

Site based exposure

c13.02-1S *Bushfire Planning* provides policy directions for planning authorities about the level of acceptable exposure for new development enabled by a planning scheme amendment:

- *Directing population growth and development to low risk locations, being those locations assessed as having a radiant heat flux of less than 12.5 kilowatts/square metre under AS3959-2018 Construction of buildings in bushfire-prone areas (Standards Australia).*
- *Not approving any strategic planning document, local planning policy, or planning scheme amendment that will result in the introduction or intensification of development in an area that has, or will on completion have, more than a BAL-12.5 rating under AS3959-2018.*

Areas of high biodiversity conservation value

c13.02-1S *Bushfire Planning* provides directions on situations where a bushfire risk and biodiversity values are both present:

- *Ensure settlement growth and development approvals can implement bushfire protection measures without unacceptable biodiversity impacts by discouraging settlement growth and development in bushfire affected areas that are of high biodiversity conservation value.*

No increase in risk

c13.02-1S *Bushfire Planning* provides an overall view of acceptable risk:

- *Ensuring the bushfire risk to existing and future residents, property and community infrastructure will not increase as a result of future land use and development.*
- *Achieving no net increase in risk to existing and future residents, property and community infrastructure, through the implementation of bushfire protection measures and where possible reduce bushfire risk overall.*

2.4 Bushfire Management Overlay (c44.06)

The purpose of the Bushfire Management Overlay is:

- *To ensure that the development of land prioritises the protection of human life and strengthens community resilience to bushfire.*
- *To identify areas where the bushfire hazard warrants bushfire protection measures to be implemented.*
- *To ensure development is only permitted where the risk to life and property from bushfire can be reduced to an acceptable level.*

The Bushfire Management Overlay is generally applied to patches of vegetation (except grasslands) that are larger than 4 hectares in size. Where such a patch of vegetation exists, a 150 metre ember protection buffer is added and this land is also included in the Bushfire Management Overlay. Areas of extreme hazard are also included in the Bushfire Management Overlay.

Planning Advisory Note 46: Bushfire Management Overlay Methodology and Criteria (2013, DPTLI) provides more information on where the Bushfire Management Overlay is applied.

2.5 Bushfire Planning (c53.02)

c52.03 *Bushfire Planning* specifies the requirements that apply to a planning application under c44.06 Bushfire Management Overlay. The purpose of this provision is:

- *To implement the Municipal Planning Strategy and the Planning Policy Framework.*
- *To ensure that the development of land prioritises the protection of human life and strengthens community resilience to bushfire.*
- *To ensure that the location, design and construction of development appropriately responds to the bushfire hazard.*
- *To ensure development is only permitted where the risk to life, property and community infrastructure from bushfire can be reduced to an acceptable level.*
- *To specify location, design and construction measures for a single dwelling that reduces the bushfire risk to life and property to an acceptable level.*

2.6 Bushfire prone area (c13.02-1S, Building Act 1993 & Building Regulations 2018)

Bushfire Prone Areas are areas that are subject to or likely to be subject to bushfire. The Minister for Planning makes a determination to designate Bushfire Prone Areas under section 192A of the Building Act 1993.

Designated Bushfire Prone Areas include all areas subject to the Bushfire Management Overlay. Bushfire Prone Areas also include grassland areas and, occasionally, smaller patches of non-grassland vegetation.

The Building Regulations 2018 require bushfire construction standards in these areas and these are implemented by the relevant building surveyor as part of the building permit. These construction standards are referred to as bushfire attack levels (BAL).

Where land is included in the Bushfire Prone Area is also included in the Bushfire Management Overlay, the requirements of the Bushfire Management Overlay take precedence. Where this is the case, the building regulations ensure bushfire construction requirements in a planning permit are given effect to by the relevant building surveyor at the time a building permit is issued.

2.7 Use and development control in Bushfire Prone Areas (c13.02-1S)

c13.02-1S *Bushfire Planning* includes planning requirements for Bushfire Prone Areas. These are in the form of a 'use and development control' that applies to certain uses that are in a Bushfire Prone Area.

The use and development control applies to Subdivisions of more than 10 lots, Accommodation, Child care centre, Education centre, Emergency services facility, Hospital, Indoor recreation facility, Major sports and recreation facility, Place of assembly, and any application for development that will result in people congregating in large numbers.

The use and development control requires that when assessing a planning permit application:

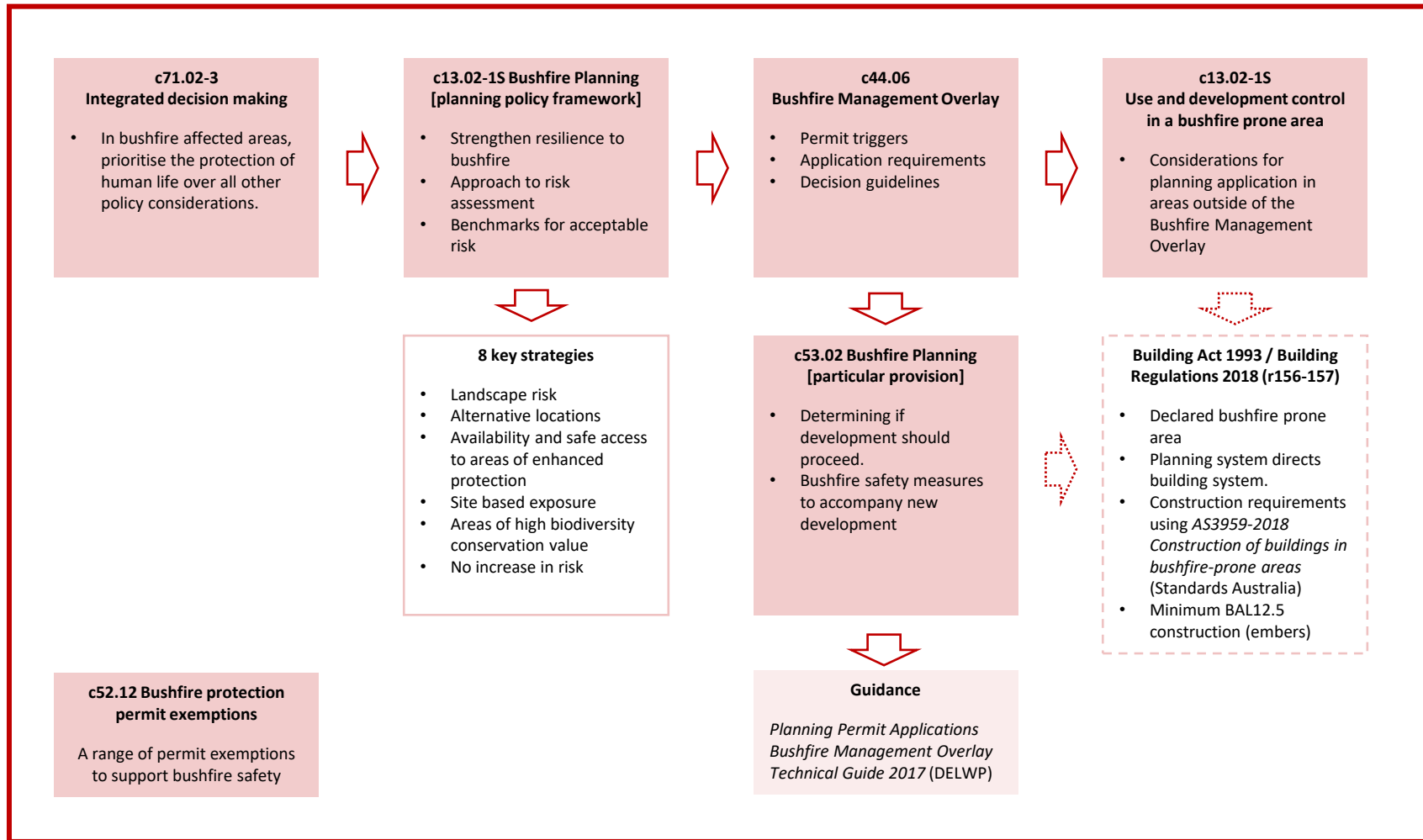
- *Consider the risk of bushfire to people, property and community infrastructure.*
- *Require the implementation of appropriate bushfire protection measures to address the identified bushfire risk.*
- *Ensure new development can implement bushfire protection measures without unacceptable biodiversity impacts.*

2.8 Bushfire protection permit exemptions (c52.12)

Bushfire related permit exemptions are included in c52.12 *Bushfire protection exemptions*. Exemptions are included for the following matters:

- Permit exemptions to create defendable space around existing buildings used for accommodation. They apply to bushfire prone areas, which includes land subject to the Bushfire Management Overlay. These are commonly known as the 10/30 rule and the 10/50 rule. This exemption applies to accommodation constructed or approved on or before 2009.
- Permit exemptions to create defendable space for a dwelling under the Bushfire Management Overlay, where the defendable space is specified in a planning permit issued after 31 July 2014. The permit exemption only applies to specified zones, which include residential zones. The permit exemption does not apply to defendable space specified in a planning permit for uses other than a dwelling and for any uses outside of the Bushfire Management Overlay.
- Permit exemptions for buildings and works associated with a community fire refuge and a private bushfire shelter (where a Class 10c building).

FIGURE 2: PLANNING SCHEME BUSHFIRE PROVISIONS AND SUPPORTING MATERIAL



3. Bushfire context

This section describes the bushfire context of the Study Area using a range of information sources that help understand bushfire. The matters identified include information typically provided as part of a bushfire hazard landscape assessment as described in *Planning Permit Applications Bushfire Management Overlay Technical Guide* (DELWP 2017).

Spatial information on the bushfire context is included in Attachment 1.

3.1 Bushfire conditions in Victoria

The Department of Environment, Land, Water and Planning (2015) identifies key features relevant to bushfires in Victoria. These include:

- A forest fire danger index of well over 100
- Severe drought conditions
- Temperatures above 40° C
- Relative humidity below 10%
- Strong to gale-force north-westerly winds
- A strong to gale-force west-south-westerly wind change that turns the eastern flank of a running bushfire into a wide new fire front.

DELWP notes that these weather conditions are representative of where a bushfire does most of its damage in a single day. The greatest loss of life and property in Victoria have historically been caused by such single day bushfires.

DELWP (2020) further notes that climate change is forecast to:

- Extend the bushfire season
- Make bushfires larger, more severe, and more frequent
- Make days with an elevated fire danger rating more frequent
- Start the bushfire season earlier, with more bushfires starting in spring (which may also change fire weather conditions that are experienced, such as wind speed and direction).

3.2 Bushfire management strategy guiding public agencies

The *Gippsland Bushfire Management Strategy* (DELWP 2020) considers the long-term implications of bushfire to direct the activities of bushfire-related public agencies and to reduce bushfire risk to people, property, infrastructure and economic activity.

The bushfire management strategy contains information that assists in appreciating the landscape bushfire risk. An extract is included in this report for context.

See **Attachment 1 Figure A: Modelled house loss bushfire risk**

3.3 Planning scheme bushfire designations

Planning schemes identify potentially bushfire affected land through the inclusion of land into the Bushfire Management Overlay or within a designated bushfire prone area (referenced in *c13.02-1S Bushfire Planning* and approved under the Building Act 1993).

3.3.1 Bushfire Management Overlay

The Bushfire Management Overlay is applied across Victoria based on areas of non-grassland vegetation larger than 4ha, with a 150m buffer applied to account for ember attack. It is also applied to land likely to be subject to extreme bushfire behaviour.

The Bushfire Management Overlay is not applied to any part of the Study Area. This reflects the lack of non-grassland bushfire hazards that meet the 4ha size threshold.

3.3.2 Bushfire prone area

A bushfire prone area is applied to all land within the Bushfire Management Overlay along with grassland areas, smaller patches of non-grassland vegetation and land usually within 150m or 50m of these areas.

For the Study Area, grasslands are included in the Bushfire Prone Area whilst low and lower fuel parts of the settlement are excluded except for a 50m buffer on the grassland edges of the settlement.

See **Figure 1D: Bushfire Management Overlay and bushfire prone area**

3.4 Victorian Fire Risk Register

The Victorian Fire Risk Register (VFRR) is a data set prepared by fire authorities and local councils that identifies assets at risk of bushfire. The human settlement data is most relevant to planning scheme decision making.

The VFRR is useful to the extent that it shows current assets (for example, settlements) at risk, according to fire authorities and the local council. The VFRR should not however be over-emphasised in planning decision making as it has not been prepared for this purpose and does not contemplate new risk that might arise because of a planning decisions.

The VFRR identifies the grassland interfaces of the settlement areas of Yarragon as being at medium risk. This is consistent with how grassland risks are generally assessed in the VFRR in many parts of Victoria.

See **Attachment 1 Figure B: Victorian Fire Risk Register human settlement polygons**

3.5 Regional bushfire planning assessment

The *Regional Bushfire Planning Assessment Gippsland Region 2012* (DPCD) provides information about 'identified areas' where a range of land use planning matters intersect with a bushfire hazard.

Identified areas apply to the rural living areas to the south of the Study Area, reflecting that the southern aspect of Yarragon is affected by landscape hazards further to the south. However, no identified areas are identified within the Study Area itself.

See **Attachment 1 Figure 1E: Regional Bushfire Planning Assessment**

3.6 Joint Fuel Management Program

The Joint Fuel Management Program outlines where Forest Fire Management Victoria, the CFA and (sometimes) other public agencies intend to carry out fire management operations on Victoria's public and private land over the next three years. The Joint Fuel Management Program is published by Forest Fire Management Victoria (2021).

The Joint Fuel Management Program can include the following treatments:

- Asset protection zones designed to provide localised protection to human life, property and key assets.
- Bushfire moderation zones designed to reduce the speed and intensity of bushfires.
- Landscape management zones designed to reduce overall bushfire hazard at the landscape scale, in addition to land management and ecological objectives.

At a landscape scale, there are no treatments relevant to Yarragon as hazard areas are predominantly grasslands and not on public land.

See **Attachment 1 Figure C: Joint fuel management program**

3.7 Bushfire history

Bushfire history can be informative to understanding possible bushfire behaviour, but where bushfire has or has not occurred in the past should not be overemphasised in planning decision making. All bushfire hazards are assumed capable of being part of a bushfire and planning decision making is required to respond to bushfire hazards on this basis.

However, bushfire history can assist in understanding how communities have previously experienced bushfire and can reiterate important features likely to arise in any future bushfire (for example, the effect of the late afternoon wind change typical in Victoria's worst bushfire weather).

There is limited bushfire history in the landscape around Yarragon.

See **Attachment 1 Figure 1D: Bushfire history**

4. Landscape and strategic bushfire considerations

This section describes landscape bushfire hazards. Having regard to the contextual information in Section 3, it considers how the bushfire hazard in the surrounding landscape may affect the Study Area.

Landscape bushfire hazards are important because they help to understand how bushfire may impact on a location, including the likelihood of a bushfire threatening a location, its likely intensity and destructive power, and the potential impact on life and property.

The extent of the surrounding landscape that is relevant is determined by factors such as the extent and continuity of vegetation, potential fire runs and where a bushfire can start, develop and grow large. The extent of bushfire hazard relevant may be 1-2km or up to 50km, depending on the locality.

The landscape analysis in this section takes a similar approach to a bushfire hazard landscape assessment described in *Planning Permit Applications Bushfire Management Overlay Technical Guide* (DELWP 2017). This includes the identification of landscape types that help understand the relative risk between different places.

See **Figure 4A: Overview of landscape types**

The section enables key strategies in *c13.02 Bushfire Planning* to be considered. These strategies include the following:

Landscape bushfire considerations

c13.02-1S Bushfire Planning requires a tiered approach to assessing the hazard:

- *Considering and assessing the bushfire hazard on the basis of [...] landscape conditions - meaning the conditions in the landscape within 20 kilometres and potentially up to 75 kilometres from a site.*
- *Assessing and addressing the bushfire hazard posed to the settlement and the likely bushfire behaviour it will produce at a landscape, settlement, local, neighbourhood and site scale, including the potential for neighbourhood-scale destruction.*

Availability of safe areas

c13.02-1S Bushfire Planning requires a location in easy reach that provides absolute protection for life from the harmful effects of bushfire:

- *Ensuring the availability of, and safe access to, areas assessed as a BAL-LOW rating under AS3959-2018 Construction of Buildings in bushfire-prone areas (Standards Australia) where human life can be better protected from the effects of bushfire.*
- *Directing population growth and development to low risk locations and ensuring the availability of, and safe access to, areas where human life can be better protected from the effects of bushfire.*

Landscape areas described in this section are derived from two key two variables :

- Landscape bushfire hazards and their potential to generate extreme fire behaviour and neighbourhood scale destruction; and
- Availability and access to low fuel areas that may provide shelter from the harmful effects of bushfire.

See **Figure 4B: Landscape bushfire analysis**

4.1 Landscape bushfire hazards

Landscape bushfire hazards are primarily from grasslands.

Due to the highly modified environment grassland areas are often in a managed setting either because of agricultural activities or managed as part of the gardens associated with rural living and low-density residential development. For considering the landscape risk associated with grassland areas, it is assumed that the grasslands are unmanaged.

The Country Fire Authority (2022) identify the following grassfire characteristics:

- *Grassfires can start and spread quickly and are extremely dangerous.*
- *Grassfires can travel up to 25 km per hour and pulse even faster over short distances.*
- *Grass is a fine fuel and burns faster than bush or forests.*
- *Grassfires tend to be less intense and produce fewer embers than bushfires, but still generate enormous amounts of radiant heat.*
- *The taller and drier the grass, the more intensely it will burn.*

- *The shorter the grass, the lower the flame height and the easier the fire will be to control.*
- *Grassfires can start earlier in the day than bushfires, because grass dries out more quickly when temperatures are high.*

Interspersed with grassland areas are areas of fragmented vegetation. These will include clumps of non-grassland vegetation, roadside vegetation, strips of trees (for example, along vehicle accesses and water courses) and the occasional smaller patch of non-grassland vegetation. The extent of fragmentation will be a factor when considering bushfire at the local scale but the impact on landscape-scale bushfire is minimal. The grassland vegetation will be the dominant driver of bushfire behaviour in the grasslands around the Study Area.

Forested areas arise 4.5km to the south-west of the Study Area, with some areas of forest forming part of the same hazard area arising 2km to the south / south-east.

4.2 Likely landscape bushfire scenarios

The extent of grasslands means a larger grassfire is capable of approaching the Study Area, most likely under the influence of a north-westerly wind and/or a south-westerly wind on the wind change typical in Victoria's bushfire weather. Grassfires may start in any location.

4.5km to the south west of the Study Area is a large area of forest vegetation. Extreme bushfire behaviour is to be expected in that area. The presence of this area of hazard on an aspect likely to move a bushfire towards Yarragon is noted, and somewhat increases the landscape risk to the Study Area by increasing the potential for grassfires to arise.

However, at the southern edge of the Study Area, the presence of the forested areas does not materially alter the landscape risk to Yarragon or require any specific treatment than what is necessary for grasslands, in any event.

Figure 4C provides a generalised understanding of how bushfire threatens settlements.

See **Figure 4C: Generalised understanding of how bushfire threatens settlements**

4.3 Low fuel areas

An assessment has been made of the location and access to places that are lower fuel where human life can be better protected from the harmful effects of bushfire. Low fuel areas can provide protection by enabling people to move away from bushfire hazards if they need to.

c13.02-1S Bushfire Planning defines low fuel places as BAL:Low. BAL:Low places are where hazardous vegetation is more than 100m away (50m for grasslands). Hazardous vegetation for the purpose of BAL:Low is defined as vegetation that cannot be excluded under 2.2.3.2 of *Australian Standard AS3959:2018 Construction of buildings in bushfire-prone areas* (Standards Australia).

In BAL:Low places, people sheltering in the open air will not be exposed to flame contact and the highest levels of radiant heat from a moving bushfire, although radiant heat from some hazards may still be life threatening. BAL:Low places may also be subject to localised fires, which could include gardens and structures on fire. BAL:Low places do not consider ember attack, which may arise in these areas.

BAL:Low places are present in most parts of the existing settlement where more than 50m away from grasslands. For the Study Area, the land not included in a Bushfire Prone Area is a credible estimate of land that is capable of being assessed as BAL:Low. It provides a reliable assessment of low-fuel land in Yarragon.

Urban development is likely, over time, to create more low fuel areas as can be seen in recently completed urban development in the southern parts of Yarragon.

Other places of shelter

There are no designated places of safety in the landscape (for example, a neighbourhood safer place). This is expected given the relatively lower landscape risk and the availability of low-fuel areas as part of urban areas.

4.4 Landscape types

Based on the likely bushfire scenarios, the potential for neighbourhood scale destruction and the availability and access to low fuel areas, landscape types can be applied. The identified landscape types are necessarily strategic and are not intended to be scaled to apply to individual properties. They do however provide an indication on the relative risk in different parts of the bushfire Study Areas based on a neighbourhood scale of assessment.

Landscape type 1 is assessed for the Study Area. Landscape type 1 is described by DELWP (2017) as follows:

- *There is little vegetation beyond 150 metres of the site (except grasslands and low-threat vegetation)*
- *Extreme bushfire behaviour is not possible*
- *The type and extent of vegetation is unlikely to result in neighbourhood scale destruction of property*
- *Immediate access is available to a place that provides shelter from bushfire (usually capable of being provided within a site or development proposal).*

Landscape type 1 positions the Study Area at the lowest end of landscape risk on the spectrum of risk in Victoria using the landscape type typology.

FIGURE 4A: OVERVIEW OF LANDSCAPE TYPES



Planning Permit Applications Bushfire Management Overlay Technical Guide (DELWP, 2017) identifies landscape types to inform planning decision making based on the risk from the landscape beyond the site. They enable landscape bushfire information to be described according to a simple framework to assist planning decision making.

Landscape types assist in:

- Consistently describing landscape hazards. Landscape hazards are bushfire hazards more than 150m from an area that inform the likelihood of a bushfire threatening a location and its likely intensity and destructive power.
- Describing proximity and access to low fuel areas that may provide shelter from bushfire. In these areas, people may avoid flame contact and can withstand the effects of radiant heat from a moving bushfire.
- Understanding the relative risk between different locations.

Landscape types when applied provide a spatial representation of how different areas are affected by landscape scale bushfire considerations. Based on this, places that are relatively higher or lower risk emerge.

The diagram on this page summarises landscape types.

LANDSCAPE TYPE 1	LANDSCAPE TYPE 2	LANDSCAPE TYPE 3	LANDSCAPE TYPE 4
<ul style="list-style-type: none"> • There is little vegetation beyond 150 metres of the site (except grasslands and low-threat vegetation) • Extreme bushfire behaviour is not possible • The type and extent of vegetation is unlikely to result in neighbourhood scale destruction of property • Immediate access is available to a place that provides shelter from bushfire 	<ul style="list-style-type: none"> • The type and extent of vegetation located more than 150 metres from the site may result in neighbourhood-scale destruction as it interacts with the bushfire hazard on and close to a site • Bushfire can only approach from one aspect and the site is located in a suburban, township or urban area managed in a minimum fuel condition • Access is readily available to a place that provides shelter from bushfire. This will often be the surrounding developed area 	<ul style="list-style-type: none"> • The type and extent of vegetation located more than 150 metres from the site may result in neighbourhood-scale destruction as it interacts with the bushfire hazard on and close to a site • Bushfire can approach from more than one aspect • The area is located in an area that is not managed in a minimal fuel condition • Access to an appropriate place that provides shelter from bushfire is not certain 	<ul style="list-style-type: none"> • The broader landscape presents an extreme risk • Bushfires may have hours or days to grow and develop before impacting¹ • Evacuation options are limited or not available
 Lower risk from the bushfire landscape		Higher risk from the bushfire landscape 	



Study area

¹ Adapted by author

FIGURE 4B: LANDSCAPE BUSHFIRE ANALYSIS

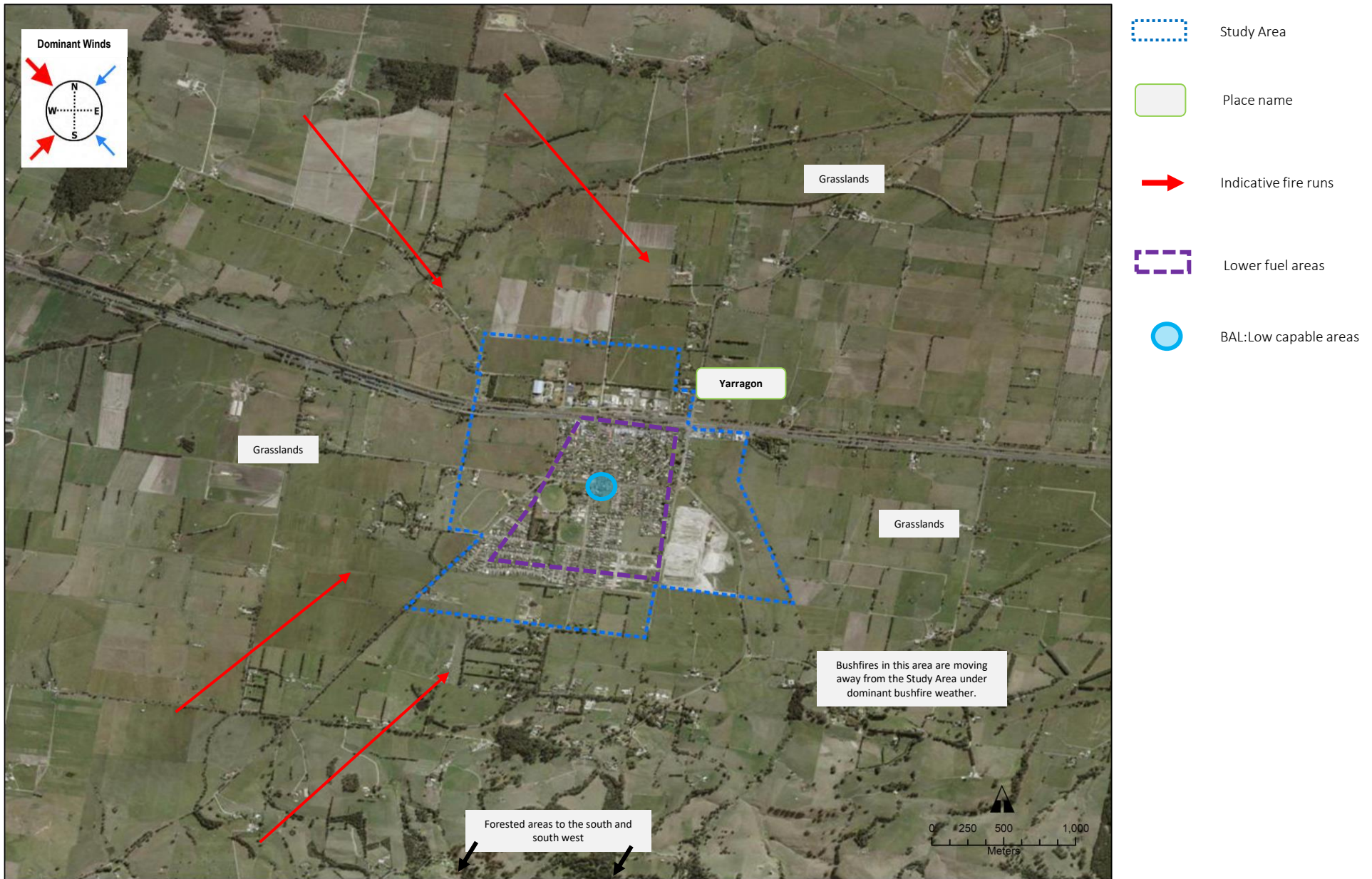
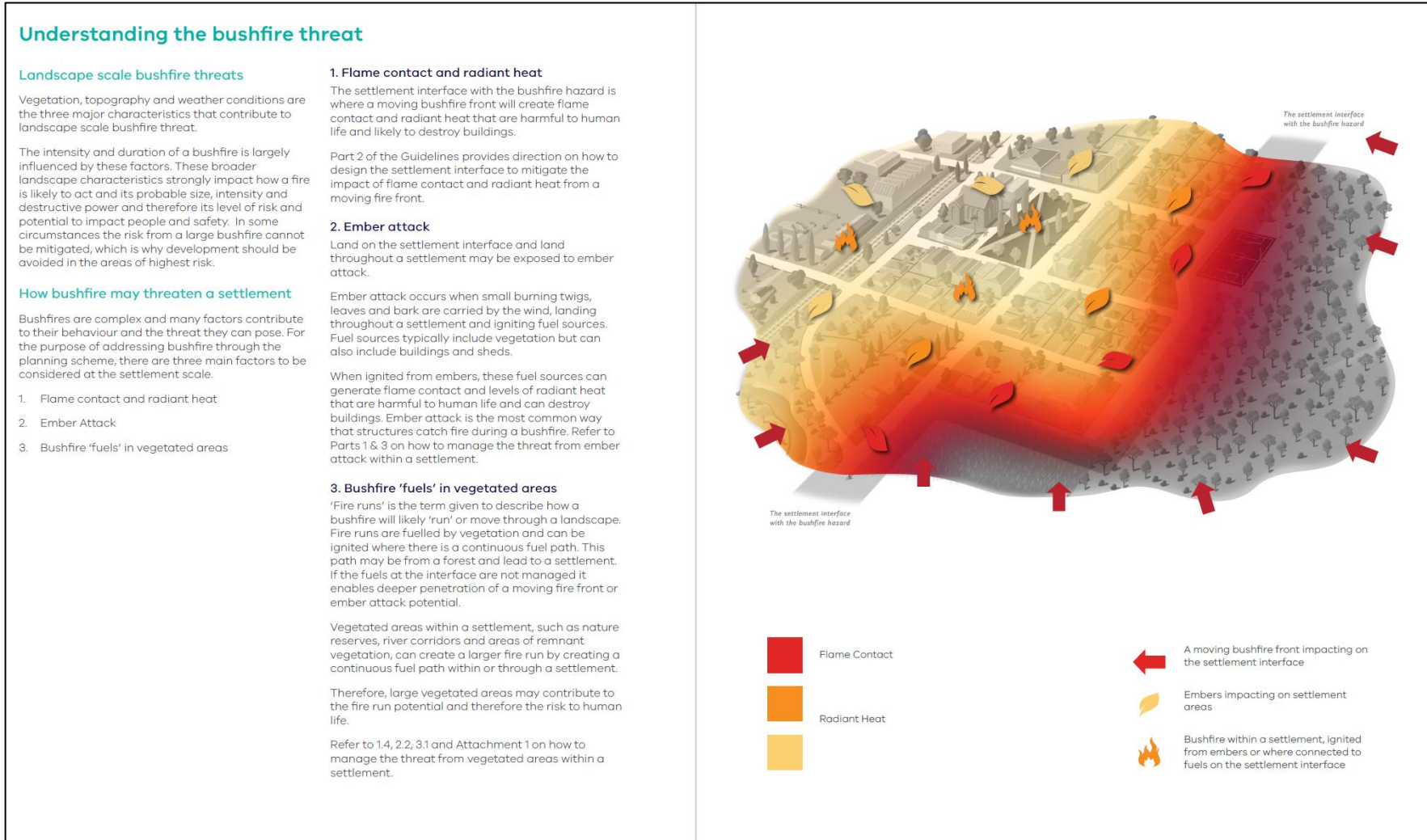


FIGURE 4C: GENERALISED UNDERSTANDING OF HOW BUSHFIRE THREATENS SETTLEMENTS (DELWP 2020)



5. Exposure to bushfire at the neighbourhood and local scale (12.5kw/sq.m of radiant heat)

Exposure to bushfire at the neighbourhood and local scale assesses the level of radiant heat likely to arise from hazardous vegetation within and in close proximity (150m) to a proposal. Considering exposure to bushfire enables new development to be separated from hazardous vegetation so that radiant heat of less than 12.5kw/sq.m arises, as required by *c13.02-1S Bushfire Planning* for new development enabled by a planning scheme amendment.

This section enables key strategies in *c13.02 Bushfire Planning* to be considered. These strategies include the following:

Site based exposure

- *Not approving any strategic planning document, local planning policy, or planning scheme amendment that will result in the introduction or intensification of development in an area that has, or will on completion have, more than a BAL-12.5 rating under AS3959-2018.*
- *Directing population growth and development to low risk locations, being those locations assessed as having a radiant heat flux of less than 12.5 kilowatts/square metre under AS3959-2018 Construction of buildings in bushfire-prone areas (Standards Australia).*

5.1 Methodology to determine exposure to bushfire

The methodology for a bushfire hazard site assessment as described in *Planning Permit Applications Bushfire Management Overlay Technical Guide* (DELWP 2017) and *AS3959-2018 Construction of buildings in bushfire-prone areas* (Standards Australia) informs the assessment. Key assumptions include a Fire Danger Rating of 100 and a flame temperature of 1080°C.

The hazard assessment is described on the following worksheet and diagram.

See **Figure 5A: Indicative site assessment diagram prepared at the settlement scale**

Hazard identification

Hazardous vegetation was identified within and around (150m) the Study Area using expert judgment based on field work and aerial photography. EVC's and tree cover data sets were also reviewed.

Ecological vegetation classes (EVCs) include:

- Damp Forest
- Lowland Forest
- Riparian Forest
- Riparian Scrub / Swampy Riparian Woodland
- Shrubby Foothill Forest
- Swampy Scrub
- Swampy Riparian Complex
- Warm Temperate Rainforest

See **Figure 5B: Ecological vegetation classes**

Low-threat vegetation as described in *AS3959-2018 Construction of buildings in bushfire-prone areas* (Standards Australia) was excluded as it is not considered hazardous.

Slope under hazardous vegetation was assessed using the 10m contour, having regard to topographical information. Slope under hazardous vegetation informs how fast a bushfire may travel.

See **Figure 5C: Elevation based on a 10m contour**

See **Figure 5D: Slope based on 10m contour**

5.2 Planning scheme required bushfire setbacks

Setbacks from hazardous vegetation must meet Column A in Table 2, *c53.02-3 Bushfire Planning*. These setbacks provide for exposure a radiant heat flux of less than 12.5 kilowatts/square metre, as required by *c13.02-1S Bushfire Planning*.

5.3 Land exposed to a radiant heat flux of less than 12.5kw/sq.m




Satisfying the planning scheme exposure requirement in the Study Area means development enabled by the Structure Plan must be setback from bushfire hazards as follows:

- **19m for Grasslands**, based on a slope of flat / upslope.

In the context of preparing the Township Plan, these setbacks are highly achievable in the grassland setting that surrounds the settlement. Where forest / woodland is assessed, this is for completeness. They are small and more than capable of being responded to in future development. The critical site scale hazard is the grasslands.

FIGURE 5A: INDICATIVE SITE ASSESSMENT DIAGRAM PREPARED AT THE SETTLEMENT SCALE



-  Subject site
-  Grassland
-  Forest or Woodland

Not to scale, written dimensions apply

FIGURE 5B: ECOLOGICAL VEGETATION CLASSES



FIGURE 5C: ELEVATION BASED ON 10m CONTOUR

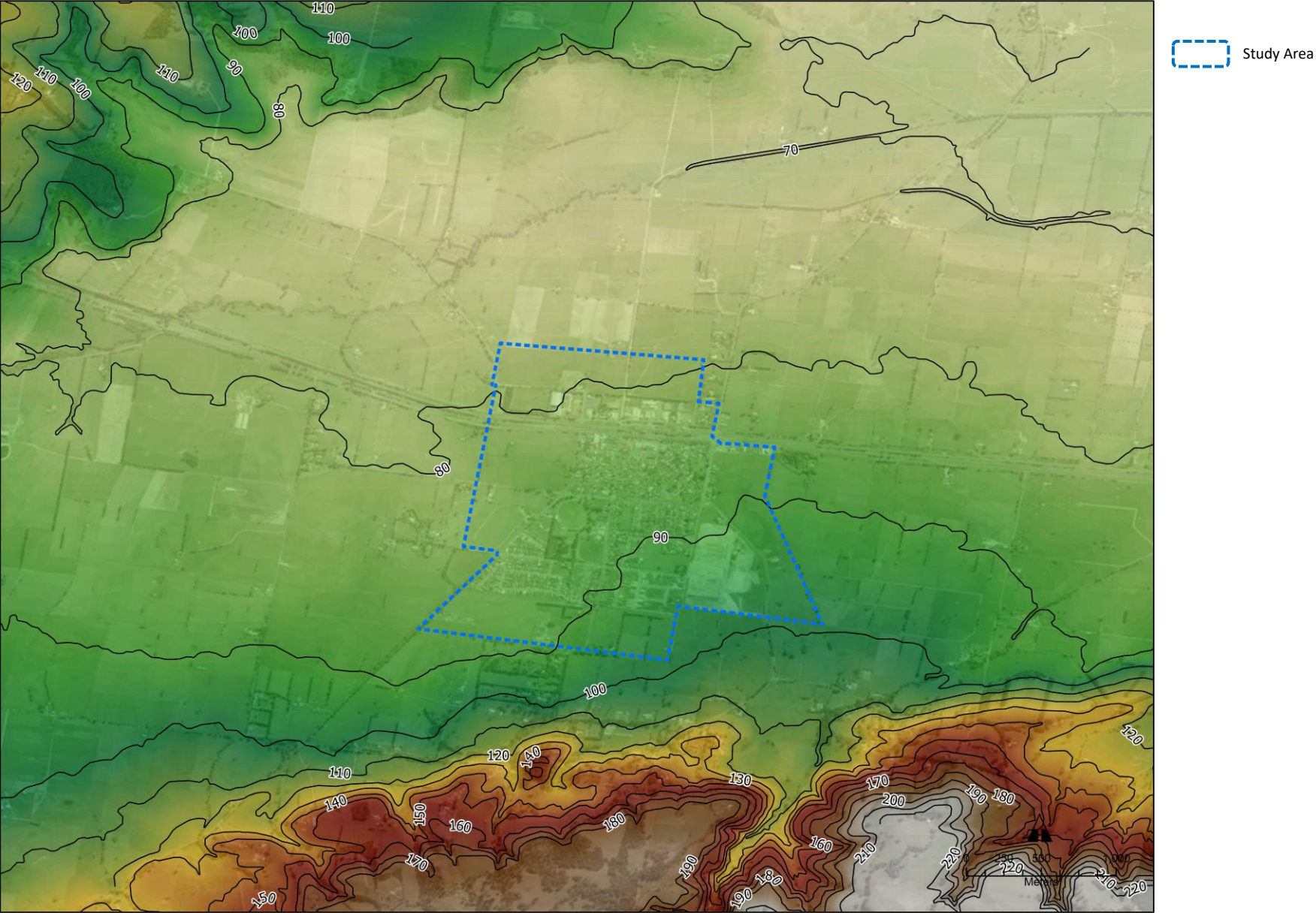
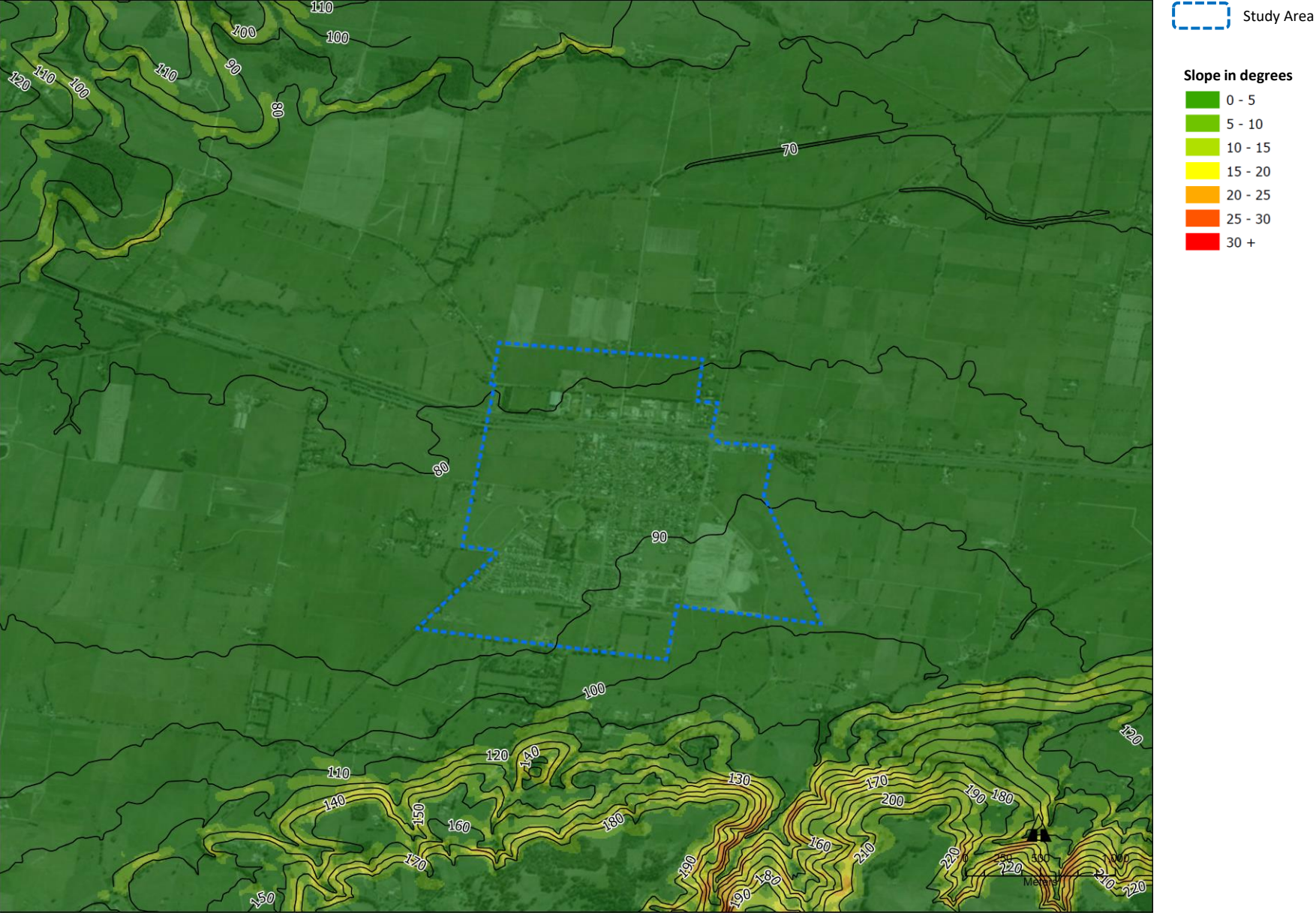


FIGURE 5C : SLOPE BASED IN A 10M CONTOUR



6. Assessment against *c13.02-1S Bushfire Planning* and other bushfire provisions

This report has considered the bushfire context of the Study Area, the landscape hazard, the availability of low fuel areas and whether there are locations that could satisfy the *c13.02 Bushfire Planning* exposure requirement.

This section uses this information to apply bushfire policies contained in the planning scheme.

6.1 *c13.02-1S Bushfire Planning*

6.1.1 Landscape bushfire considerations

c13.02-1S Bushfire Planning requires a tiered approach to assessing the hazard:

- *Considering and assessing the bushfire hazard on the basis of [...] landscape conditions - meaning the conditions in the landscape within 20 kilometres and potentially up to 75 kilometres from a site.*
- *Assessing and addressing the bushfire hazard posed to the settlement and the likely bushfire behaviour it will produce at a landscape, settlement, local, neighbourhood and site scale, including the potential for neighbourhood-scale destruction.*

The bushfire hazard landscape assessment has considered the bushfire hazard at the strategic and landscape scales as required by these policies.

The residual risk at the landscape scale is from grassfire. Grassfire is likely to arise from the north-west, west and south-west of the Study Area under dominant bushfire weather in Victoria.

Mitigating the landscape impact of grassfire is highly achievable through the separation of development from unmanaged grasslands and the planning of development to be low-fuel, preventing grassfire from penetrating urban areas and providing the ability for people to move away from the hazard interface. These outcomes are highly achievable in the Township Plan.

The identified landscape type is Landscape type 1. Landscape type 1 positions the Study Area at the lowest end of landscape risk on the spectrum of risk in Victoria using the landscape type typology. Due to the lack of non-grassland landscape scale hazards, the potential for extreme bushfire behaviour is limited.

Based on the landscape assessment undertaken, it is concluded that development within the Study Area is consistent with landscape-scale bushfire considerations.

The landscape assessment identified forested hazards 4.5km to the south-west. This increases the potential for grassfires. The presence of this area of hazard on an aspect likely to move a bushfire towards Yarragon somewhat increases the landscape risk to the Study Area. However, at the edge of the Study Area, the risk is from grassfire and the presence of the forested area of hazard does not require any specific treatment other than what is necessary for grasslands, in any event.

Due to the separation that is available, there is also no basis to change / increase the landscape type on the southern aspect.

6.1.2 Alternative locations for development

c13.02-1S Bushfire Planning includes two strategies that seek to direct new development:

- *Give priority to the protection of human life by [...] directing population growth and development to low risk locations[.]*
- *Assessing alternative low risk locations for settlement growth on a regional, municipal, settlement, local and neighbourhood basis.*

The residual risk is from grassfires. This is a routine risk area in Victoria and is where most new growth is directed to, including for example growth areas on the Melbourne – Warragul corridor. There is no relative risk benefit in directing development away from the Study Area based on the grassland risk.

The relative risk is better understood through landscape types, with the Study Area assessed as Landscape type 1, the lowest landscape type using the DELWP methodology.

The 4.5km of separation from forested hazards to the south west is generous, relative to other areas (for example, growth areas in Cardinia Shire abutting the southern Dandenongs) and provides sufficient separation to fully manage any residual risk on the southern interface of Yarragon.

The Study Area is a preferred location for development, consistent with other settlements in grassland areas along the Pakenham – Warragul corridor and where significant new development is being directed under various planning schemes.

6.1.3 Availability of safe areas

c13.02-1S Bushfire Planning requires a location in easy reach that provides absolute protection for life from the harmful effects of bushfire:

- *Ensuring the availability of, and safe access to, areas assessed as a BAL-LOW rating under AS3959-2018 Construction of buildings in bushfire-prone areas (Standards Australia) where human life can be better protected from the effects of bushfire.*
- *Directing population growth and development to low risk locations and ensuring the availability of, and safe access to, areas where human life can be better protected from the effects of bushfire.*

BAL:Low areas in proximity to the Study Area comprise most of the existing settlement of Yarragon. It will be important as development moves outside of existing low fuel areas that new low fuel areas are created as part of new development. This is highly achievable in the grassland setting.

It is essential that this outcome be given effect to in the Structure Plan and the planning scheme. Recommendations later in this report outline how this can be achieved.

6.1.4 Site based exposure

c13.02-1S Bushfire Planning provides directions for planning authorities about the level of acceptable exposure for new development enabled by a planning scheme amendment:

- *Not approving any strategic planning document, local planning policy, or planning scheme amendment that will result in the introduction or intensification of development in an area that has, or will on completion have, more than a BAL-12.5 rating under AS3959-2018.*
- *Directing population growth and development to low risk locations, being those locations assessed as having a radiant heat flux of less than 12.5 kilowatts/square metre under AS3959-2018 Construction of buildings in bushfire-prone areas (Standards Australia).*

The assessment of site based exposure prepared as part of this report confirms that development can be set back from bushfire hazards to achieve a radiant heat flux of less than 12.5kw/sq.m in completed development. Based on this, exposure of future development would be consistent with *c13.02-1S Bushfire Planning*.

It is essential that this outcome be given effect to in the Structure Plan and the planning scheme. Recommendations later in this report outline how this can be achieved.

6.1.5 Areas of high biodiversity conservation value

c13.02-1S Bushfire Planning provides directions on situations where bushfire and high biodiversity conservation values correlate:

- *Ensure settlement growth and development approvals can implement bushfire protection measures without unacceptable biodiversity impacts by discouraging settlement growth and development in bushfire affected areas that are of high biodiversity conservation value.*

It is beyond the scope of this report to assess the biodiversity conservation value of vegetation that may need to be removed or managed as a result of bushfire requirements. However, given the lack of vegetation on the subject site, it is reasonable to assume that development can accommodate bushfire protection measures.

6.1.6 No increase in risk

c13.02-1S Bushfire Planning provides an overall view of acceptable risk:

- *Ensuring the bushfire risk to existing and future residents, property and community infrastructure will not increase as a result of future land use and development.*
- *Achieving no net increase in risk to existing and future residents, property and community infrastructure, through the implementation of bushfire protection measures and where possible reduce bushfire risk overall.*

Directing development to Landscape type 1 areas, as has been assessed for the Study Area, is consistent with the bushfire policies and directions contained in the planning scheme. There is no planning scheme bushfire factor that would warrant not directing growth and development as recommended in this report. The risk from bushfire can be managed in accordance with standard planning scheme responses to bushfire hazards.

The recommended areas for possible growth include all parts of the Study Area. There is no basis to differentiate different areas based on bushfire factors.

It has been noted that forested areas arises 4.5km to the south-west of the Study Area. The grasslands between Yarragon and the forested areas provide a protective benefit to Yarragon. The recommendations in this report are based on the grassland areas not being altered with the introduction of other hazardous vegetation, especially close to the Study Area.

Bushfire management planning, the day to day activities of the Council, CFA and land managers, will support this. However, planning decision making should be cognisant of this necessity and not enable the introduction of bushfire hazards through planning decision making.

It is therefore recommended that the Township Plan spatially include these areas as being afforded protection from the introduction of bushfire hazards. There are precedents for such approaches being taken in planning schemes, including c22.12 of the Yarra Ranges Planning Scheme that includes a mapped 'strategic fire break area' for Healesville as well as the recently adopted Surf Coast Statement of Planning Policy that identifies landscape areas for strategic planning purposes on its framework plan.

By reinforcing the protective benefits to Yarragon that these area provide, it can be clearly demonstrated that the forested areas to the south-west do not create a risk increase when combined with future growth in Yarragon.

See **Figure 7A: Spatial Recommendations**

6.2 c13.02 Use and development control in a bushfire prone area

Planning consideration is required under the *c13.02-1S Use and development control in a bushfire prone area* for the proposal. The use and development control requires that when assessing a planning permit application:

- *Consider the risk of bushfire to people, property and community infrastructure.*
- *Require the implementation of appropriate bushfire protection measures to address the identified bushfire risk.*
- *Ensure new development can implement bushfire protection measures without unacceptable biodiversity impacts.*

The Use and development control in a bushfire area will apply to future planning applications to subdivide the land into more than 10 lots. This provides a planning scheme mechanism to ensure future development fully considers bushfire at the planning application stage.

To give some specificity to considering bushfire in future decision making, it is recommended that the Structure Plan include mitigation to increase certainty and to enable the Planning Authority to demonstrate through planning scheme content that bushfire has been fully addressed.

The following mitigation is recommended:

- Requiring future development to achieving the *c13.02-1S Bushfire Planning* exposure requirement.

- Where development would create new lots for Accommodation in a Bushfire Prone Area that are larger than 1,200sq.m, *c53.02 Bushfire Planning, Table 6 Vegetation management requirements* should be applied. This will provide for a low fuel outcome and not enable hazards to increase over time. Other bespoke approaches to hazard management in areas with larger lots can be investigated and determined at subsequent stages and to the satisfaction of the relevant fire authority.

New lots for Accommodation smaller than 1,200sq.m mostly avoid hazards being introduced due to the lot size itself. Larger lots for industrial development tend to have high site coverages and managed gardens, mostly avoiding the need for vegetation management requirements.

- Perimeter roads be provided on grassland interfaces / permanent hazard edges. This includes in development with larger lot sizes and industrial development.

This outcome is now typical in grassland areas, including in Melbourne's growth areas and arising from precinct structure plans and CFA requirements. It will support preventing a moving grassfire from entering developed areas.

The above mitigation can be included into the Township Plan and would support the effective consideration of bushfire in future planning applications.

6.3 Conclusion

The proposal is consistent with the bushfire policies and directions contained in the planning scheme. There is no planning scheme bushfire factor that would warrant the proposal not proceeding. More specifically, the proposal has considered and complies with:

- *c13.02-1S Bushfire Planning.*
- *c13..02-1S Use and development control in a bushfire prone are.*

Recommendations in this report are intended to reiterate the bushfire requirements that should be integrated into the Structure Plan and future decisions. These should operate in the planning scheme as local content.

7. Recommendations

Based on the assessments contained in this report, the following recommendations should be accommodated in the final Structure Plan.

Recommendation 1: Interfaces with a bushfire hazard

Development will be required to be set back from assessed hazards for a distance no less than that required to ensure exposure is less than 12.5kw of radiant heat. This equates to Column A in Table 2 to *c53.02 Bushfire* in the planning scheme and includes:

- A minimum 19m from grassland assessed vegetation.

Constructed (perimeter) roads can be used as part of the above setbacks.

A bushfire hazard site assessment should be prepared for development enabled by the Township Plan to confirm vegetation type, slope and final setbacks.

Recommendation 2: Vegetation in completed development

c53.02 Bushfire Planning, Table 6 Vegetation management requirements should be applied to all new lots for Accommodation within a Bushfire Prone Area which are larger than 1,200sq.m. Alternative hazard management approaches can be developed to the satisfaction of the relevant fire authority in conjunction with future planning.

Notes:

As a result of Recommendations 1 and 2, the Structure Plan can demonstrate that development is exposed to less than 12.5kw/sq.m of radiant heat and a construction standard of no more than BAL:12.5 will arise.

Bushfire vegetation management requirements are shown on Figure 7C.

Recommendation 3: Perimeter roads

Development must be separated from permanent hazards by perimeter roads on permanent grassland interfaces.

Note:

Hazard interface treatments are indicatively shown on Figure 7B.

Recommendation 4: Recognising lower fuel areas in planning decision making

The Structure Plan should spatially include areas to the south of Yarragon as being lower fuel to support these areas not being compromising over time by the introduction of hazardous vegetation in planning decision making. These grassland areas provide a protective benefit to Yarragon from forested areas further south / south-west.

Note:

The area is notionally shown on Figure 7A.

Recommendation 5: Planning scheme controls

The recommendations in this report should form part of the planning scheme, within the Structure Plan itself if it is to be incorporated into the planning scheme or through local planning scheme content if the Structure Plan is not to be incorporated into the planning scheme.

FIGURE 7A: SPATIAL RECOMMENDATIONS



Study Area



Maintain low fuel areas
in the core of Yarragon



Avoid introducing bushfire hazards
through planning decision making

FIGURE 7B: EXPECTED INDICATIVE TREATMENT ON HAZARD INTERFACES: GRASSLAND HAZARDS

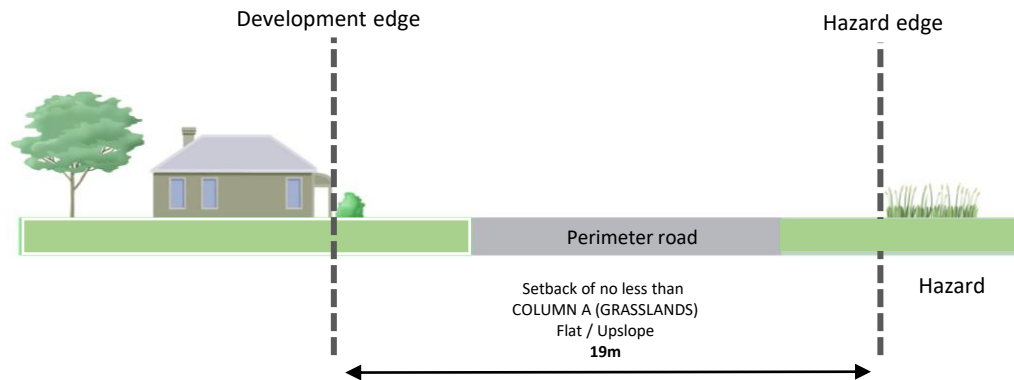


FIGURE 7C: TABLE 6, c53.02 BUSHFIRE PLANNING BUSHFIRE VEGETATION MANAGEMENT STANDARDS (DEFENDABLE SPACE)

- Grass must be short cropped and maintained during the declared fire danger period.
- All leaves and vegetation debris must be removed at regular intervals during the declared fire danger period.
- Within 10 metres of a building, flammable objects must not be located close to the vulnerable parts of the building.
- Plants greater than 10 centimetres in height must not be placed within 3 metres of a window or glass feature of the building.
- Shrubs must not be located under the canopy of trees.
- Individual and clumps of shrubs must not exceed 5 sq. metres in area and must be separated by at least 5 metres.
- Trees must not overhang or touch any elements of the building.
- The canopy of trees must be separated by at least 5 metres.
- There must be a clearance of at least 2 metres between the lowest tree branches and ground level.

References

Baw Baw Shire Council (2022), *Yarragon Township Plan, Background Report*

Baw Baw Planning Scheme

Country Fire Authority (2022), *Grassfires – Rural* (accessed at <https://www.cfa.vic.gov.au/plan-prepare/am-i-at-risk/grassfires-rural>)

Country Fire Authority (accessed in 2022), *Victoria Fire Risk Register GIS data*

Department of Environment, Land, Water and Planning (2015), *Measuring Bushfire Risk in Victoria*

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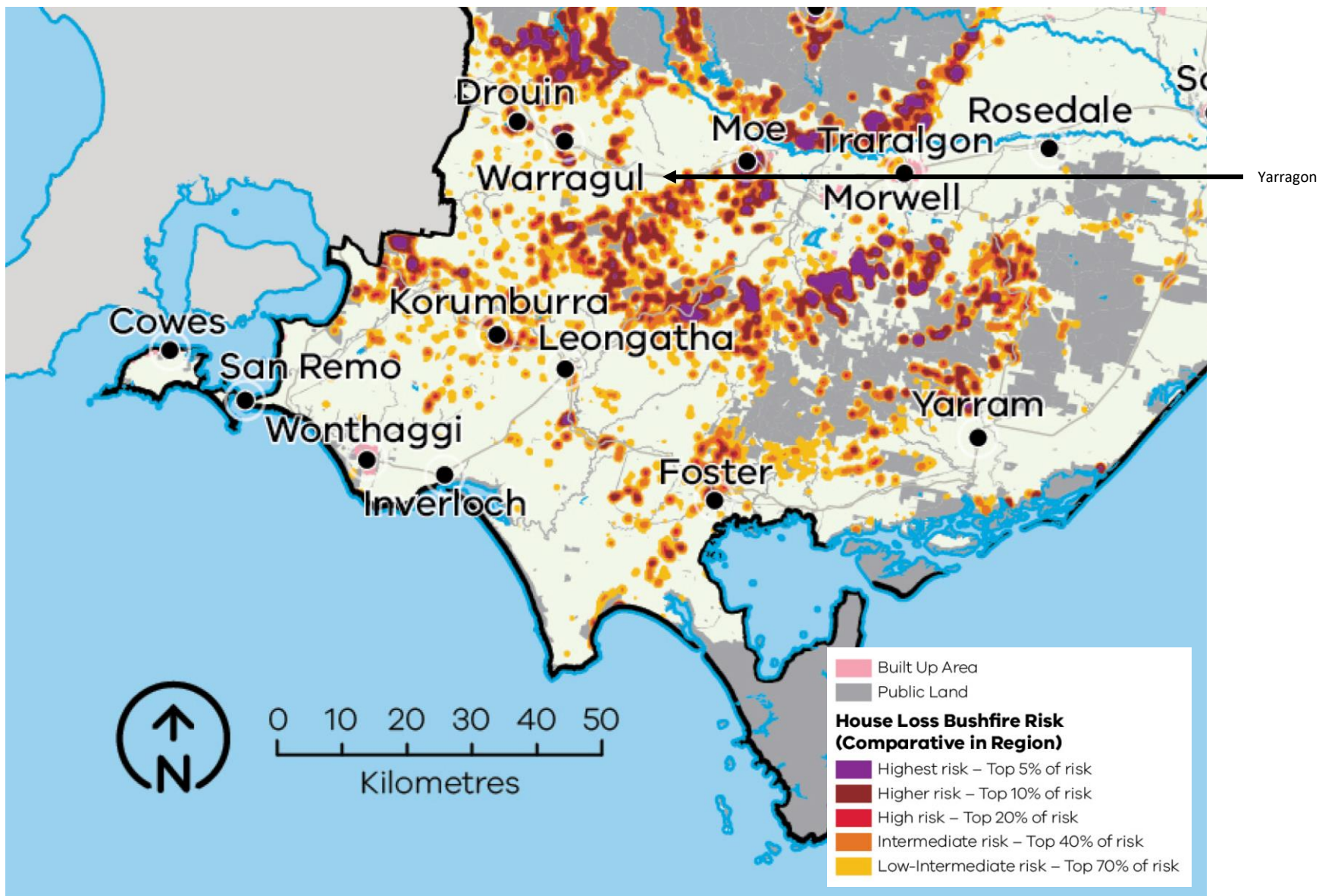
Department of Planning and Community Development (2012), *Regional Bushfire Planning Assessment - Gippsland Region*

Department of Environment, Land, Water and Planning (2020), *Design Guidelines: Settlement Planning at the Bushfire Interface*

Department of Environment, Land, Water and Planning, (accessed in August 2022), *Nature Kit 2.0* (<https://maps2.biodiversity.vic.gov.au/Html5viewer/index.html?viewer=NatureKit>)



Forest Fire Management Victoria (2022) *Strategic Bushfire Management Planning* (accessed at <https://bushfireplanning.ffm.vic.gov.au/>)

ATTACHMENT 1 FIGURE A: MODELLED HOUSE LOSS BUSHFIRE RISK (ADAPTED FROM DELWP 2020)



ATTACHMENT 1 FIGURE B: VICTORIAN FIRE RISK REGISTER HUMAN SETTLEMENT

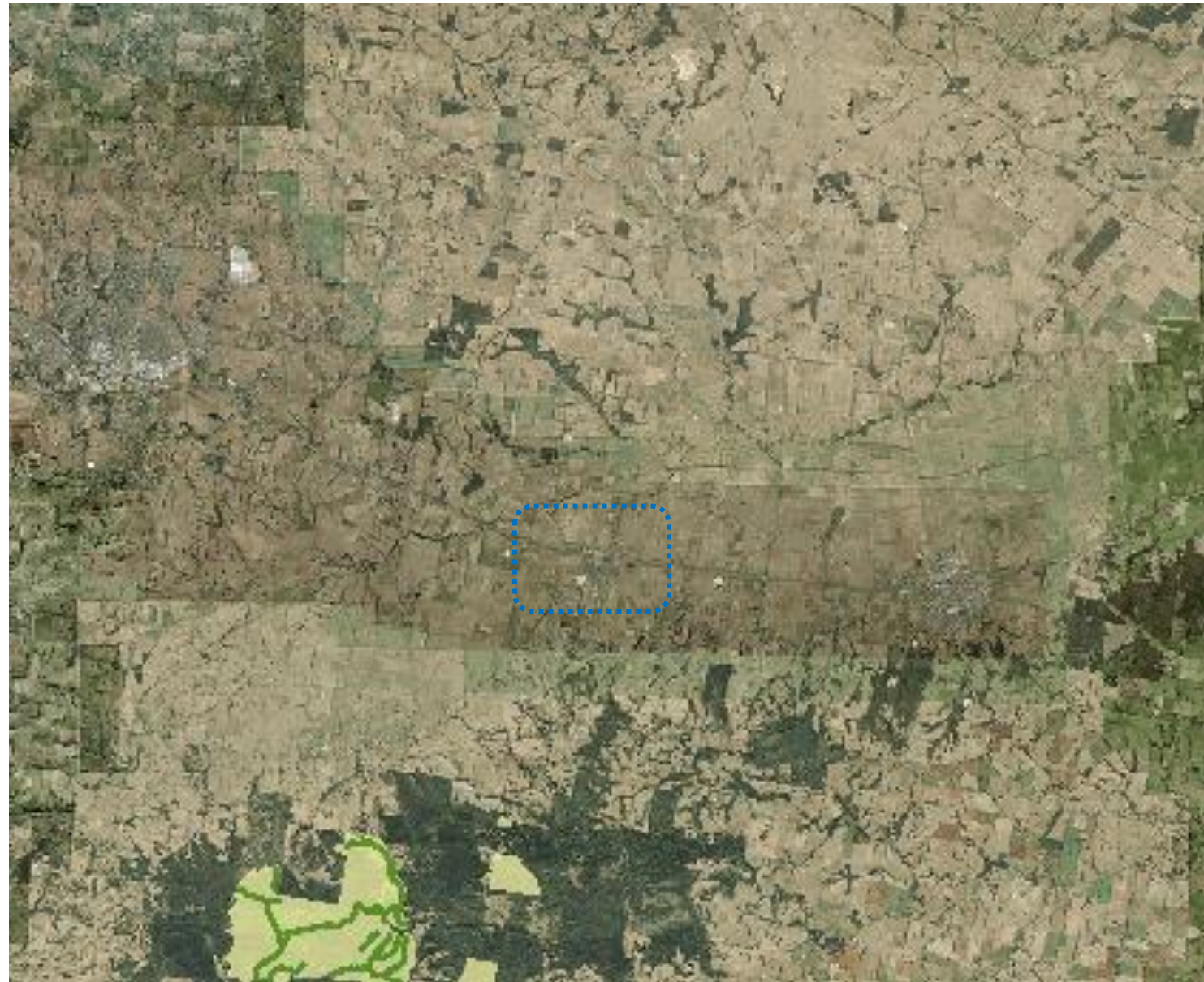


-  Study Area
-  Medium



Data extracted in 2022

ATTACHMENT 1 FIGURE C: JOINT FUEL MANAGEMENT PLAN






 Study Area

Fire Management Zones

-  1 - Asset Protection Zone
-  2 - Bushfire Moderation Zone
-  3 - Landscape Management Zone
-  4 - Planned Burn Exclusion Zone

Planned Burns

-  2021-2022
-  2022-2023
-  2023-2024

Data extracted: 2022

Source: Forest Fire Management Victoria 2022
www.ffm.vic.gov.au/bushfire-fuel-and-risk-management/joint-fuel-management-program

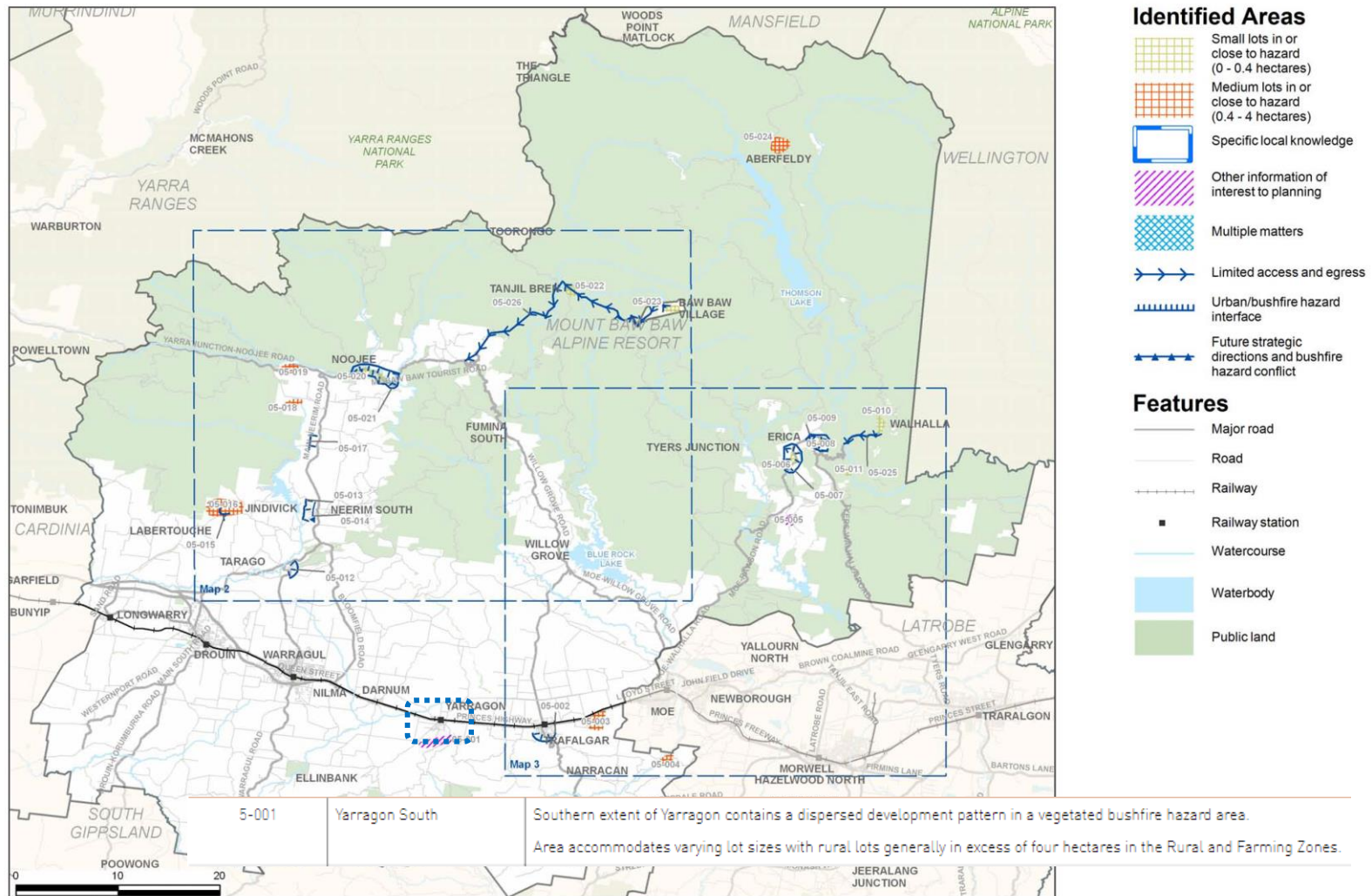
ATTACHMENT 1 FIGURE D: BUSHFIRE HISTORY



 Study Area

Data extracted in 2022

BAW BAW MUNICIPAL MAP – MAP 1



Source: DPCD 2012

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