Kevin Hazell | BUSHFIRE PLANNING

Golden Plains Shire Strategic Bushfire Assessment

Final Report

12 April 2022
Version 1.0

Prepared for:

Golden Plains Shire Council

2 Pope Street

Bannockburn VIC 3331

Contents

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.

Version Control

Version	Date	Comment	Name
v0.1	4 March 2022	Draft for Council review	Kevin Hazell Town Planner
1.0	12 April 2022	Final Report	Kevin Hazell Town Planner

1. Introduction

Kevin Hazell Bushfire Planning has been engaged by Golden Plains Shire Council (the '***Council***') to prepare a Shire-wide strategic bushfire assessment.

The purpose of this report is to provide a high-level assessment of the bushfire hazard and to consider bushfire policies in *c13.02-1S Bushfire Planning* in the Golden Plains Planning Scheme (the '***planning scheme***'). The assessment is to inform a Shire-wide settlement plan. The assessment focuses on bushfire policies that require municipal and sub-regional assessments which are important to appreciate the relative risk between different locations.

The assessment in this report when combined with settlement and neighbourhood scale bushfire assessments prepared in conjunction with specific proposals, such as a structure plan, inform how bushfire-related policies in the planning scheme are applied. This includes policies that seek to direct development and growth to locations based on bushfire considerations.

1.1 Study area

The main study area is the municipal area of Golden Plains Shire. A broader study area includes growth areas located in Ballarat City and in Geelong City. The broader study area is referenced in the regional and sub-regional commentary included in Section 4.

See **Figure 1A: Study area**

1.2 Methodology for this report

This report uses landscape types to apply selected policies in *c13.02-1S Bushfire Planning*. Landscape types assist in appreciating the relative risk between locations. Landscape types are applied from considering likely bushfire scenarios, the potential for neighbourhood scale destruction and the availability and access to safer areas.

Landscape types are described in *Planning Permit Applications Bushfire Management Overlay Technical Guide* (DELWP 2017). Landscapes type range from 1 to 4. Generally, as assessed landscape types progress through 1-4, the landscape risk increases.

See: **Figure 1B: Overview of landscape types**

The identified landscape types in this report are necessarily strategic and are not intended to be scaled to apply to individual properties. Landscape types are not always a perfect match to a particular location. They are however useful as a stepping off point for discussions and further investigations, especially at a settlement, neighbourhood or local scale.

1.3 Structure of this report

The strategic bushfire assessment includes the following:

- Section 1.1 provides background on the strategic and settlement planning context of Golden Plains Shire.
- Section 2 provides an overview of bushfire content in the planning scheme, especially 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 to 8 provides an assessment of how locational policies in *c13.02-1S Bushfire Planning* affect different locations, primarily focused on settlements, using landscape types.
- Section 9 includes a summary of recommendations.

1.4 How to use this report

References in this report to growth and development only relate to these when enabled by a planning scheme amendment. This is consistent with this report informing the preparation of a Shire-wide settlement strategy for Golden Plains and planning scheme changes arising from this. This report does not consider bushfire factors for applications under current planning scheme policies or settings and should not be used for this purpose.

FIGURE 1A: STUDY AREA

Main study area & Golden Plans Shire

Sub-regional study area - Adjoining growth areas

FIGURE 1B: 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
• 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	• 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	• 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 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	• The broader landscape presents an extreme risk • Bushfires may have hours or days to grow and develop before impacting[1] • Evacuation options are limited or not available

Lower risk from the bushfire landscape ⟷ **Higher risk from the bushfire landscape**

[1] *Adapted by author*

1.1 Context on settlement planning in Golden Plains Shire

The Golden Plains Planning Scheme provides an appreciation of how settlements and growth are currently planned in Golden Plains Shire, as derived from State, regional and local planning policies.

1.1.1 Municipal Planning Strategy

The Municipal Planning Strategy at c02.01 describes Golden Plains Shire as follows:

> *Golden Plains Shire has a total area of 2,705 square kilometres and is located south of Ballarat, north west of Geelong and approximately 70 kilometres south-west of Melbourne. The Shire shares a boundary with the Shires of Colac Otway, Corangamite, Pyrenees, Moorabool and Surf Coast and the Cities of Ballarat and Greater Geelong. Ballarat and Geelong play an important role as the service centres for the north and south of Golden Plains Shire.*
>
> *The Shire contains rich and diverse environmental, cultural and scenic landscapes including granite outcrops, deeply incised river valleys and wide open volcanic plains. These landscapes include post contact features including goldfields and station homesteads.*
>
> *The Shire is home to the Enfield and Linton State Forests, Steiglitz Historic Park, Inverleigh Nature Conservation Reserve and part of the Brisbane Ranges National Park. The Shire also contains nationally significant roadside native grasslands and grassy woodland plains that are home to the endangered striped legless lizard and spiny rice flower.*
>
> *The Shire is characterised by agricultural land used predominantly for grazing and cropping as well as other activities including intensive animal industries and wind farms. There are a large number of small townships as well as extensive natural forested areas, bushland areas and riverine gorges in the municipality.*

The strategic directions for settlements at c02.03-1 includes the following:

> *The Shire's population is dispersed, with the largest proportion of the population residing in Bannockburn, followed by Teesdale. All other townships have a population of less than 1000 people.*
>
> *Each settlement performs important living, retail, service and community roles to residents and the rural community.*
>
> *Settlement patterns are based on historic rural service centres and nineteenth century mining towns, which differ significantly between the north and south. The role of many towns has changed over time to one of commuting areas to the regional centres of Ballarat, Colac and Geelong.*
>
> *The north-west has seen a proliferation of subdivisions and subsequent rural residential developments, many of which have developed into distinct communities. There is also a proliferation of rural living development in isolated areas devoid of appropriate infrastructure. All of the towns in the Central Highlands Water district are supplied with an interconnected, potable water supply. There is sufficient infrastructure capacity to cater for all anticipated growth over the next 20 years.*
>
> *In the south-east, urban development is more focused around townships. All water is treated and the existing systems, with minor augmentations, are adequate to cater for the existing populations and anticipated growth in the immediate future.*
>
> *The majority of growth has occurred in the settlements at the south-east and north-west as more people come from Melbourne and the regional cities looking for affordable housing and a country lifestyle, close to Ballarat and Geelong. In the south-east of the municipality, the population has increased rapidly by about 40 per cent between 2005 and 2015. In the north-west area, the population increased by approximately 6 per cent during the same period.*
>
> *There is pressure for subdivision and development outside existing townships, particularly for subdivision and hobby farm development close to Geelong and Ballarat. Residential development is not supported outside existing township boundaries.*
>
> *With sufficient land being set aside for the moderate growth forecast across the Shire, no significant new areas of land need to be provided for residential development, except in Bannockburn where rezoning continues to be required to accommodate expected future growth, as identified in the Bannockburn Growth Plan (Victorian Planning Authority, May 2021).*

See **Figure 1C: c02.04 Strategic framework plan**

1.1.2 Bushfire content in the Municipal Planning Strategy

c02.03-3 Environmental risk and amenity includes content on bushfire:

> *Bushfire*
>
> *Bushfire is a significant issue across the municipality affecting built communities and natural systems. Development or rezoning of land for residential purposes can have an adverse effect on the natural environment.*
>
> *Although the protection of human life is the primary consideration, vegetation conservation is a lower, but still important, priority in bushfire prone areas.*
>
> *Bushfire risk will be mitigated by:*
>
> - *Avoiding development in bushfire prone areas.*
> - *Avoiding the rezoning of land that allows for settlement in areas of high bushfire risk, particularly where natural assets will be compromised.*
> - *Minimising the impact of bushfire protection measures on vegetation with high environmental value.*

1.1.3 Zones

Planning scheme policies are given effect to through the application of Zones. Through the applied Zones the dominant settlement patterns of Golden Plains Shire can be observed, including:

- Distinct settlements throughout Golden Plains Shire included in urban zones, such as the Township Zone and residential zones.
- Large areas of low density residential development, including land in the Rural Living Zone and Low Density Residential Zone. This includes extensive areas in the north of the Shire included in a Rural Living Zone.

See **Figure 1D: Zone Map**

FIGURE 1C: c02.04 STRATEGIC FRAMEWORK PLAN

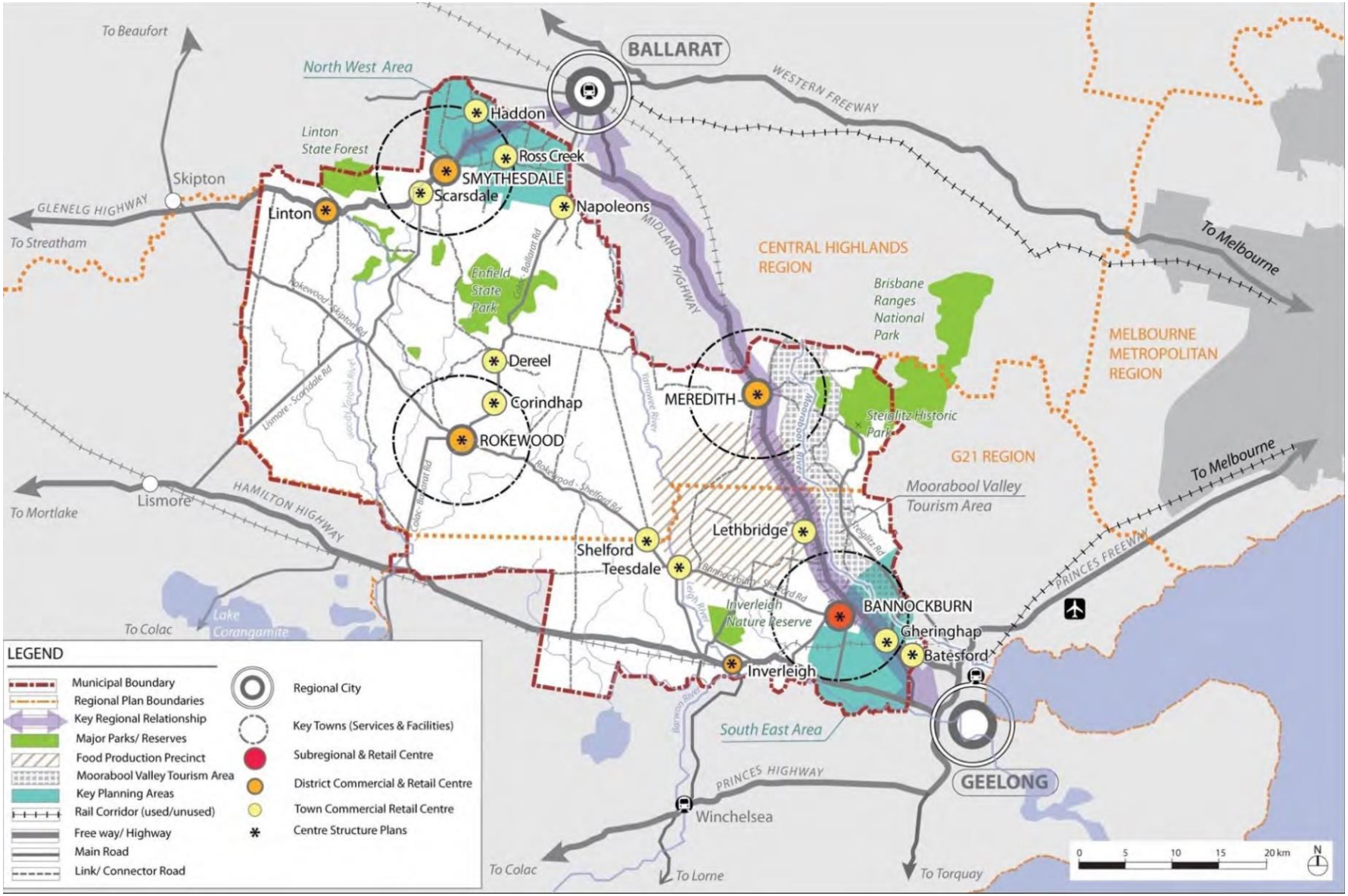
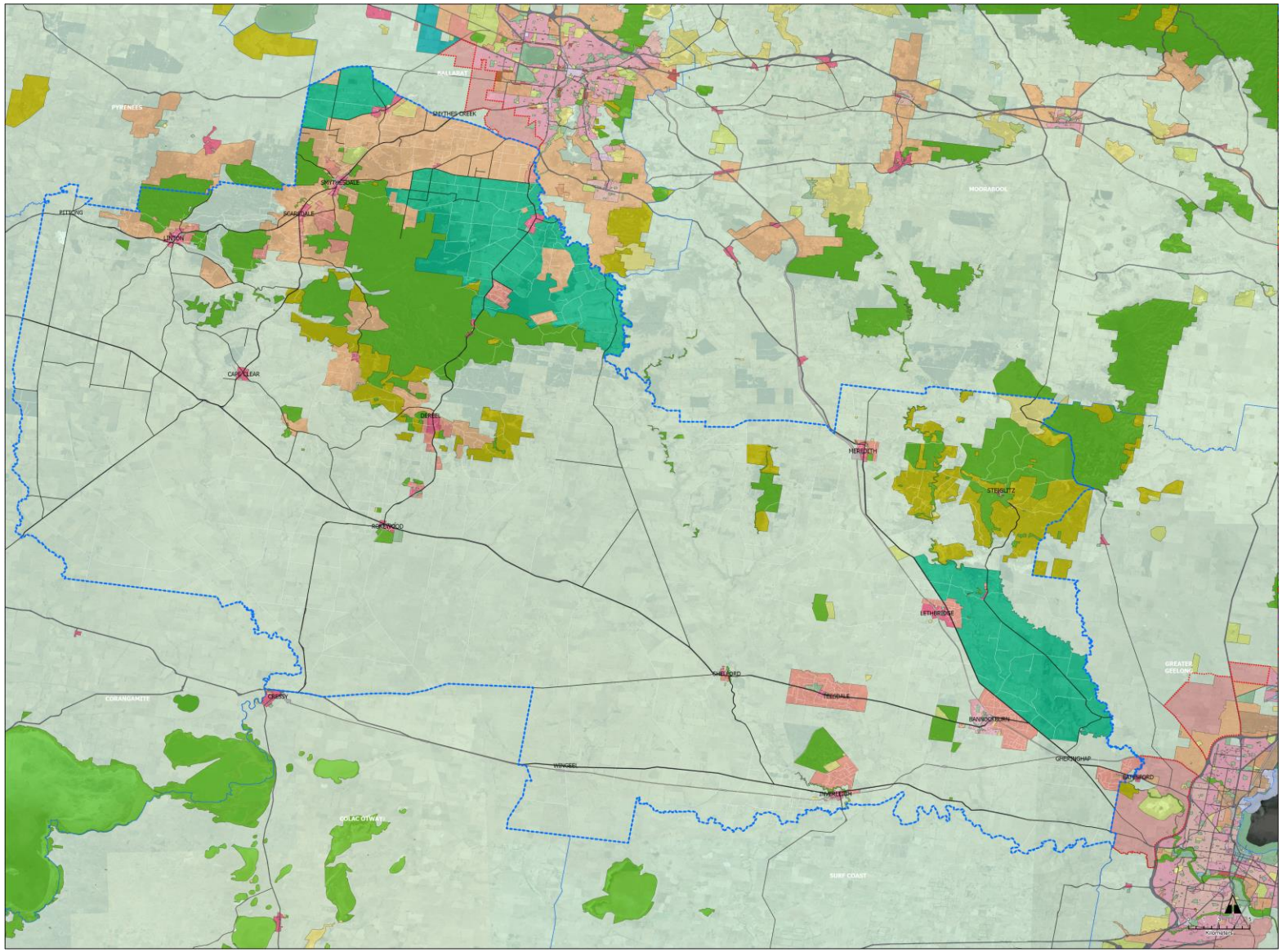


FIGURE 1D: ZONES



Main study area & Golden Plans Shire

Sub-regional study area - Adjoining growth areas

2. *c13.02-1S Bushfire Planning* locational policies and commentary

c13.02-1S Bushfire Planning includes strategies on locational considerations that influence where development could be directed to enhance life-safety outcomes in response to bushfire hazards. These locational policies relate to landscape bushfire considerations, availability of safer areas and alternative locations for development. A summary of these policies are outlined in this chapter.

2.1 Landscape bushfire considerations

Landscape bushfire considerations include the scale of likely bushfire and the type of hazard in the wider locality where a bushfire can start and grow large. The following policies require these matters to be considered:

- *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.*

These policies ensure that decision making fully appreciates whether there is potential for the most destructive bushfires to arise. They emphasise the assessment of bushfire hazards not only very close to a site or area of planning interest but in the much wider area (referred to as the bushfire '*landscape*').

2.2 Alternative locations for development

An appreciation of alternative locations for growth and development can assist in considering where best amongst alternatives can life safety be enhanced. The following policies require these matters to be considered:

- *Assessing alternative low risk locations for settlement growth on a regional, municipal, settlement, local and neighbourhood basis.*
- *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.*

Policies on assessing alternative locations for development tend to be determinative to acceptable strategic planning outcomes, including because of their focus on directing development to low risk locations. In many bushfire settings, such locations often do not exists and reinforce the need to avoid planning scheme enabled new development.

2.3 Availability of safer areas

Consideration of how occupiers of a development or people living in a specific location can move to a safer area was introduced into planning schemes in 2017. Bushfire protection is enhanced where people have a layering of options available to them, including being able to move to a safer location.

The following policies require these matters to be considered:

- *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 term BAL:Low seeks to define an area of land that is low fuel and generally more than 100m away from hazardous vegetation (or 50m for grasslands). It uses the methodology in *AS3959-2018 Construction of a building in a bushfire prone area* (Standards Australia).

This methodology does not accommodate all forms of bushfire impact, including:

- Land that may be subject to extreme ember attack.
- Land where the vegetation is low-threat as defined by AS3959-2018 but which still presents a bushfire hazard from localised vegetation and other flammable elements, including buildings being on fire.
- Land in proximity to forested areas where there are steep slopes under the hazardous vegetation and where the intensity of bushfire may compromise a safer area.

Despite limitations, policies relating to safer areas do provide a stepping-off point for considering safer areas in the development of the Shire-wide settlement plan.

2.4 Other supporting policies

c13.01-1S Natural hazards and climate change applies to bushfire decision making. 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, and these include:

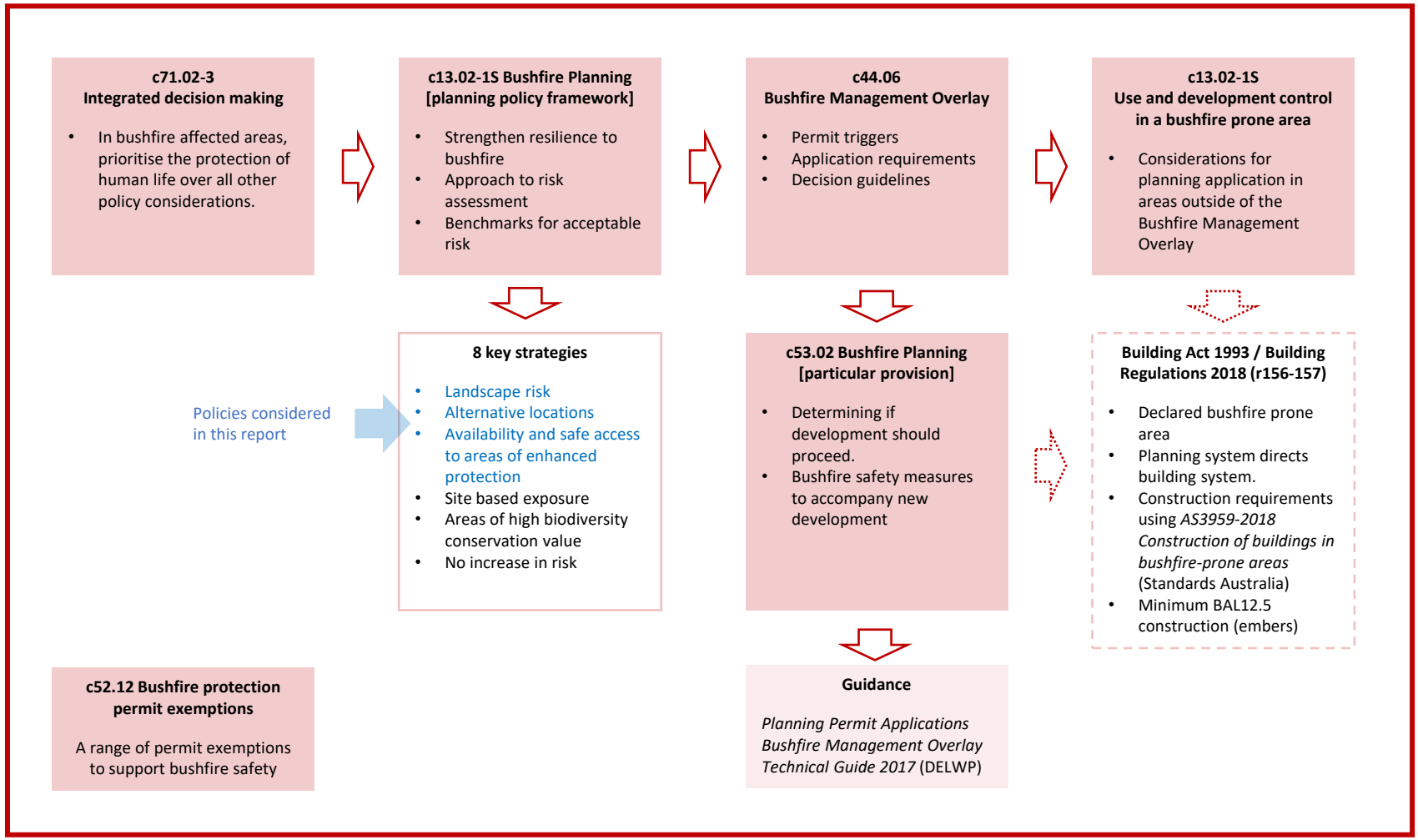
- *Consider the risks associated with climate change in planning and management decision making processes.*
- *Identify at risk areas using the best available data and climate change science.*
- *Integrate strategic land use planning with emergency management decision making.*
- *Direct population growth 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 or risk adaptation strategies to be implemented.*
- *Site and design development to minimise risk to life, property, the natural environment and community infrastructure from natural hazards.*

The above policies are complimentary to bushfire policies and reiterate the planning scheme focus on managing natural hazards by directing population growth and development to low risk locations.

2.6 Other *c13.02-1S Bushfire Planning* policies

The report considers selected strategic and locational policies in *c13.02-1S Bushfire Planning*. Other policies in *c13.02-1S Bushfire Planning* are also relevant. This includes policies that consider neighbourhood and site scale factors along with policies requiring bushfire protection measures to be successfully deployed in conjunction with new development.

FIGURE 2: PLANNING SCHEME BUSHFIRE PROVISIONS AND SUPPORTING MATERIAL



3. Bushfire context of Golden Plains Shire

This section describes the bushfire context of Golden Plains Shire 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).

3.1 Bushfire conditions

The Department of Environment, Land, Water and Planning (DEWLP) (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.

These conditions can create bushfires with powerful convection columns. Ember storms, wind-blown debris, downbursts, fire tornadoes and explosive flares of igniting eucalyptus vapour are likely to arise. 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.

The climate in the municipality is dominated by warm dry summers and cool wet winters. The bushfire season generally runs from December to April. Whilst bushfires can start any time of the year, most occur between October and April. The largest and most damaging bushfires generally occur from December through February, with about one-quarter of bushfires in January (DEWLP 2015).

DELWP (2020) 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 Landscape bushfire hazards

The bushfire hazard includes vegetation and slope, along with weather that was outlined in the previous section.

3.2.1 Vegetation

Vegetation in the Shire includes large forested areas in the northern and north-eastern parts of the Shire. This includes:

- Land orientated on a north-west to south-east axis running through the northern part of Golden Plains Shire and orientated around State parks and State Forests. Some of the hazards in these areas are also in plantations.
- Land orientated in the north-east corner of Golden Plains Shire, corresponding to forested hazard areas around Steiglitz and the Brisbane Ranges National Park.

There are also smaller and distinct patches of non-grassland vegetation, including between Meredith and Dereel and in close proximity to the settlements of Inverleigh, Bannockburn and Teesdale.

The balance of the Shire comprises grassland areas. Due to the modified environment grassland areas are often in a managed setting either because of agricultural activities, which may be both seasonal and periodical. 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.*

3.2.2 Slope

Slope under hazardous vegetation informs how fast a bushfire may travel. The Country Fire Authority (2022) identify the following characteristics of slope:

- *A fire will burn faster uphill. This is because the flames can easily reach more unburnt fuel in front of the fire. Radiant heat pre-heats the fuel in front of the fire, making the fuel even more flammable.*
- *For every 10˚ slope, the fire will double its speed.*
- *By increasing in speed the fire also increases in intensity, becoming even hotter.*
- *Fires tend to move more slowly as the slope decreases.*

Vegetated areas in steep and rugged terrain correlate with where extreme bushfire behaviour can arise.

Slope can be considered using both contours and elevation. Areas where the terrain may particularly influence bushfire behaviour at a landscape scale are in the north and the north-east parts of the Shire. Other areas are mostly flat.

See **Figure 3D: Slope based on a 10m contour**

3.3 Bushfire management strategy guiding public agencies

The *Grampians 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 to the study area. This includes the following extracts:

> *The area south of Ballarat is also high risk, driven by the Enfield State Park and surrounding state forest. This is due to the larger population that resides in these localities, as well as the number of settlements located near forests.*

The bushfire management strategy includes simulations of house loss to identify areas across a landscape where bushfires could have the greatest impact. The outputs from these simulations show that comparative to other locations in the Grampians region, some settlements in the north of Golden Plains Shire includes extensive areas where modelled house losses are anticipated. The settlements affected are orientated on a north-west to south-east axis running through the northern part of Golden Plains Shire, corresponding to forested hazard areas.

Conversely, settlements in the balance of Golden Plains Shire contain no areas identified as being at any elevated risk of modelled house loss.

See **Figure 3A: Modelled house loss bushfire risk (adapted from DELWP 2020)**

3.4 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).

See **Figure 3C: Bushfire Management Overlay and Bushfire Prone Area**

3.4.1 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.

For the study area, the Bushfire Management Overlay applies to

- Land orientated on a north-west to south-east axis running through the northern part of Golden Plains Shire, corresponding to forested hazard areas. It is noted that settlements in these area are not included in their entirety, which would be expected if the most extreme bushfire behaviour was anticipated.
- Land orientated in the north-east corner of Golden Plains, corresponding to forested hazard areas around Steiglitz and the Brisbane Ranges National Park.
- Land orientated around distinct patches of non-grassland vegetation, including between Meredith and Dereel and in close proximity to the settlements of Inverleigh, Bannockburn and Teesdale.

3.4.2 Schedules to the Bushfire Management Overlay

There are no areas of Bushfire Management Overlay that contain a schedule.

3.4.3 Bushfire Prone Area

The bushfire prone areas applies to all land within the Bushfire Management Overlay. It also applies to grassland areas, smaller patches of non-grassland vegetation and land usually within 50m of these areas.

Except for urban land not at the immediate hazard interface in Bannockburn and Inverleigh, all land in Golden Plains Shire is within a Bushfire Prone Area.

3.5 Victorian Fire Risk Register

The Victorian Fire Risk (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. The VFRR should not 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 generally identifies higher risk assets in and around the larger forested areas in the north and north-east of the Shire, with relatively lower risks identified in the grasslands and smaller areas of hazard in the southern parts of the Shire.

See **Figure 3B: Victorian Fire Risk Register human settlement polygons**

3.6 Regional bushfire planning assessment

The *Regional Bushfire Planning Assessment Grampians Region* 2012 (DPCD) provides information about 'identified areas' where a range of land use planning matters intersect with a bushfire hazard. Identified areas are identified where settlements are within or near larger forested areas in the north and east of the Shire. Other areas in Bannockburn and Inverleigh are included where they interface with smaller areas of forest vegetation.

See **Figure 3F: Regional Bushfire Planning Assessment**

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.

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).

Extensive bushfire history is recorded in and around forested areas in the Shire. This includes bushfire moving out of forested areas and into surrounding grassland areas. Bushfire history shows these forested areas have been regularly subject to bushfire.

Bushfire history shows the influence of wind patterns that are typical of Victoria's worst bushfire weather. These include bushfire and grassfire moving under the influence of a north-westerly wind followed by a south-westerly wind change.

Grassfires history is recorded in the southern and central parts of the Shire. The shape of these fires strongly correlate with dominant bushfire weather (winds).

See **Figure 3E: Bushfire history**

FIGURE 3A: MODELLED HOUSE LOSS BUSHFIRE RISK (ADAPTED FROM DELWP 2020)

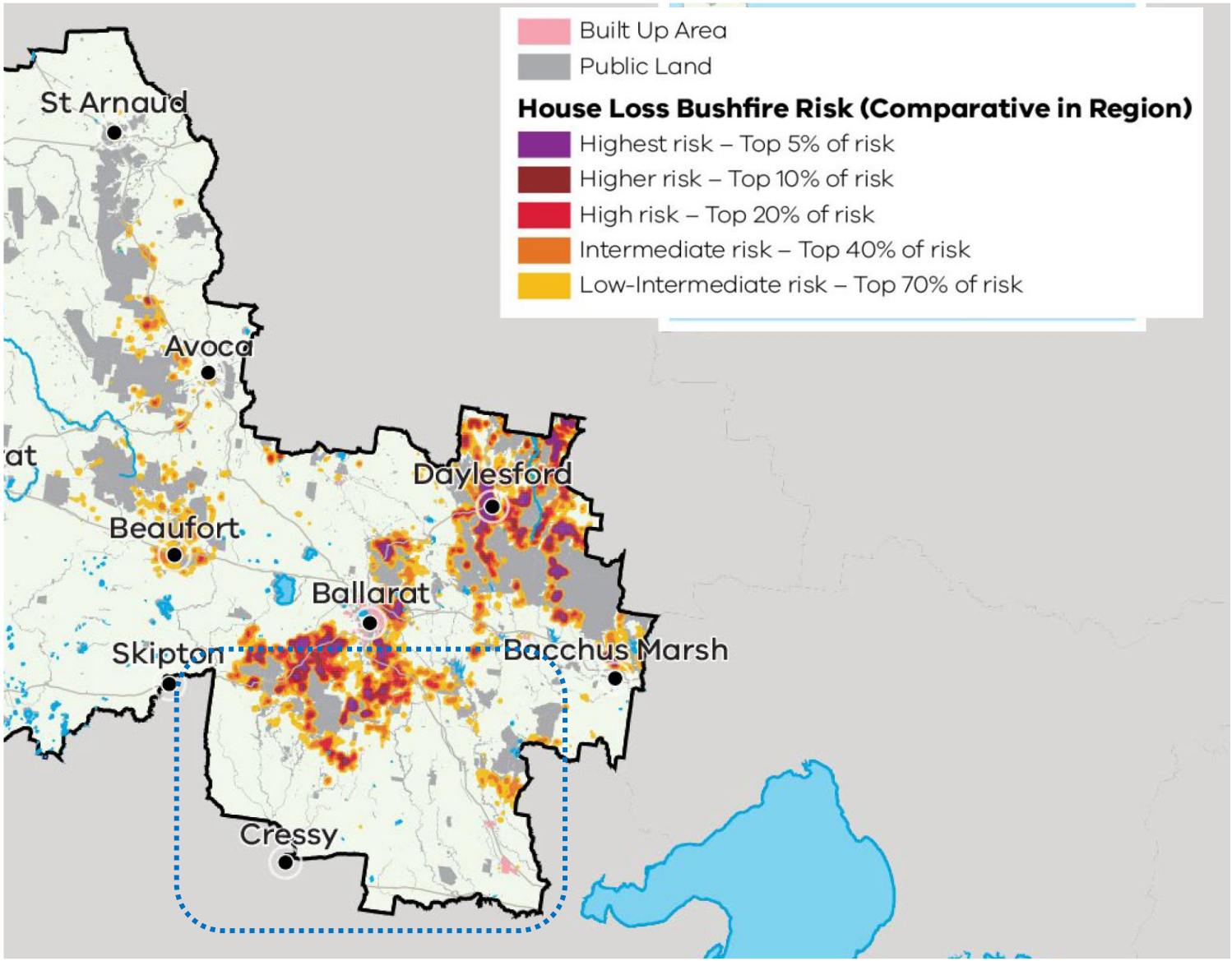
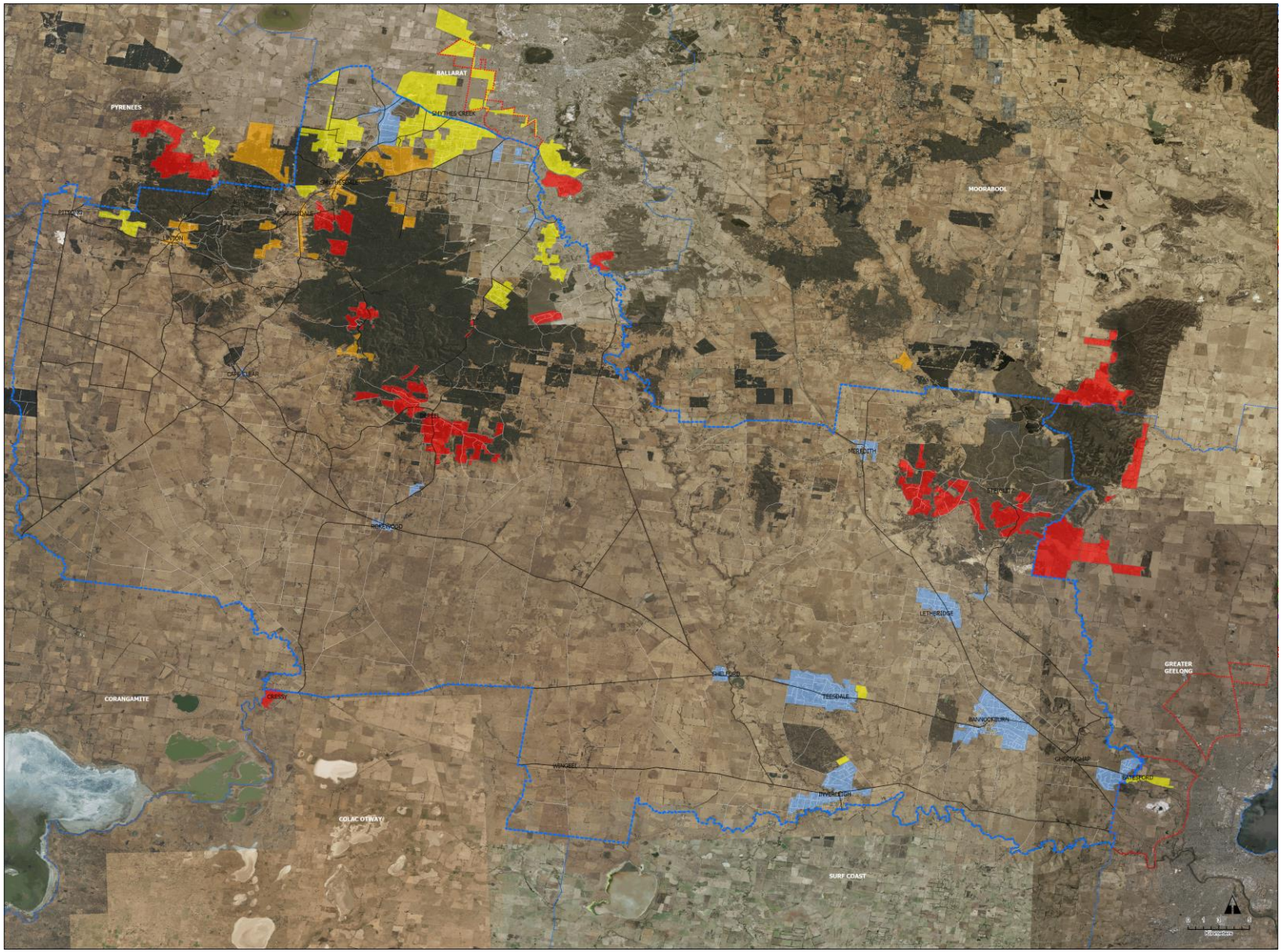


FIGURE 3B: VICTORIAN FIRE RISK REGISTER HUMAN SETTLEMENT (2022)



Data extracted in 2022

FIGURE 3C: BUSHFIRE MANAGEMENT OVERLAY AND BUSHFIRE PRONE AREA

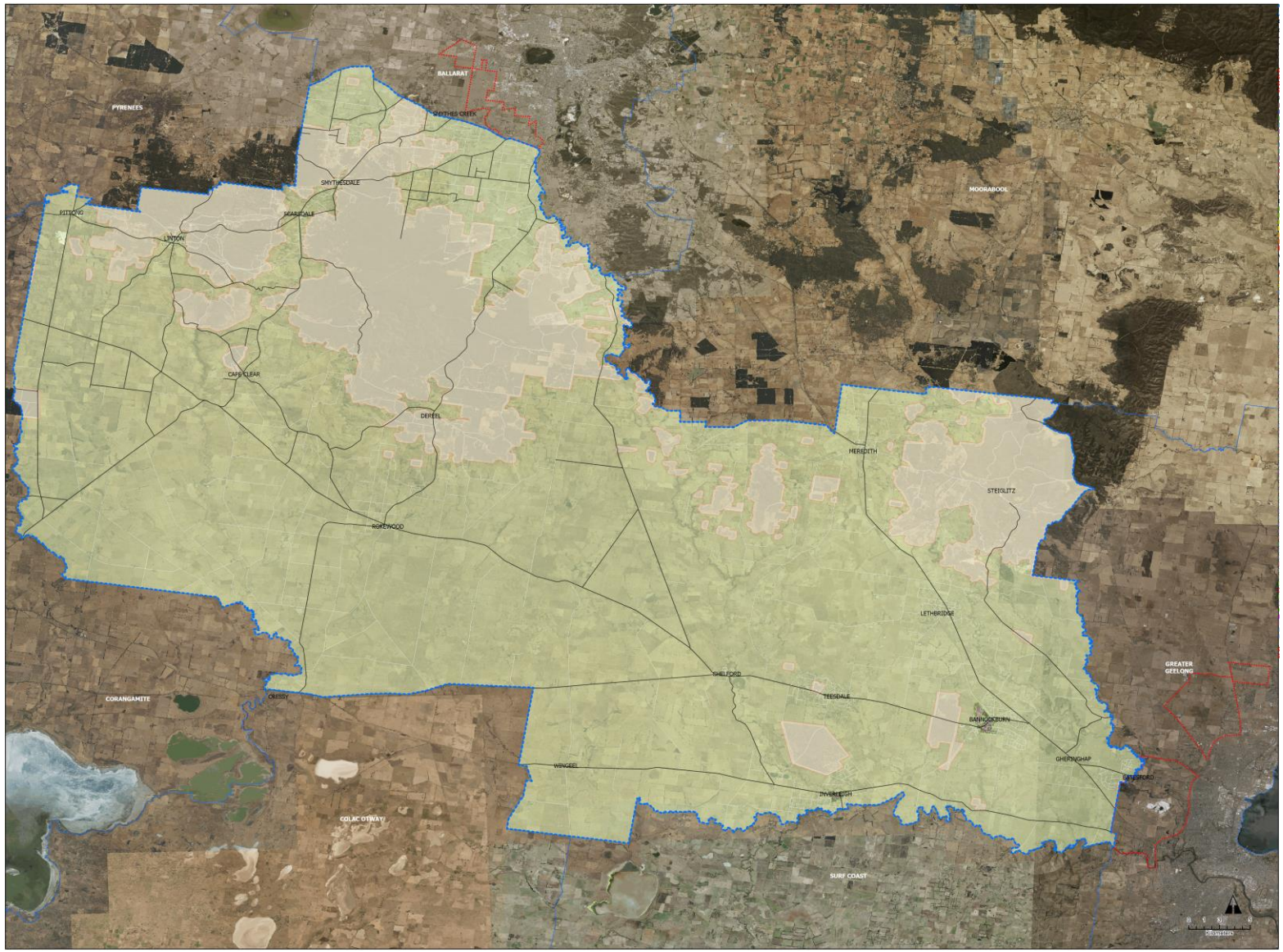
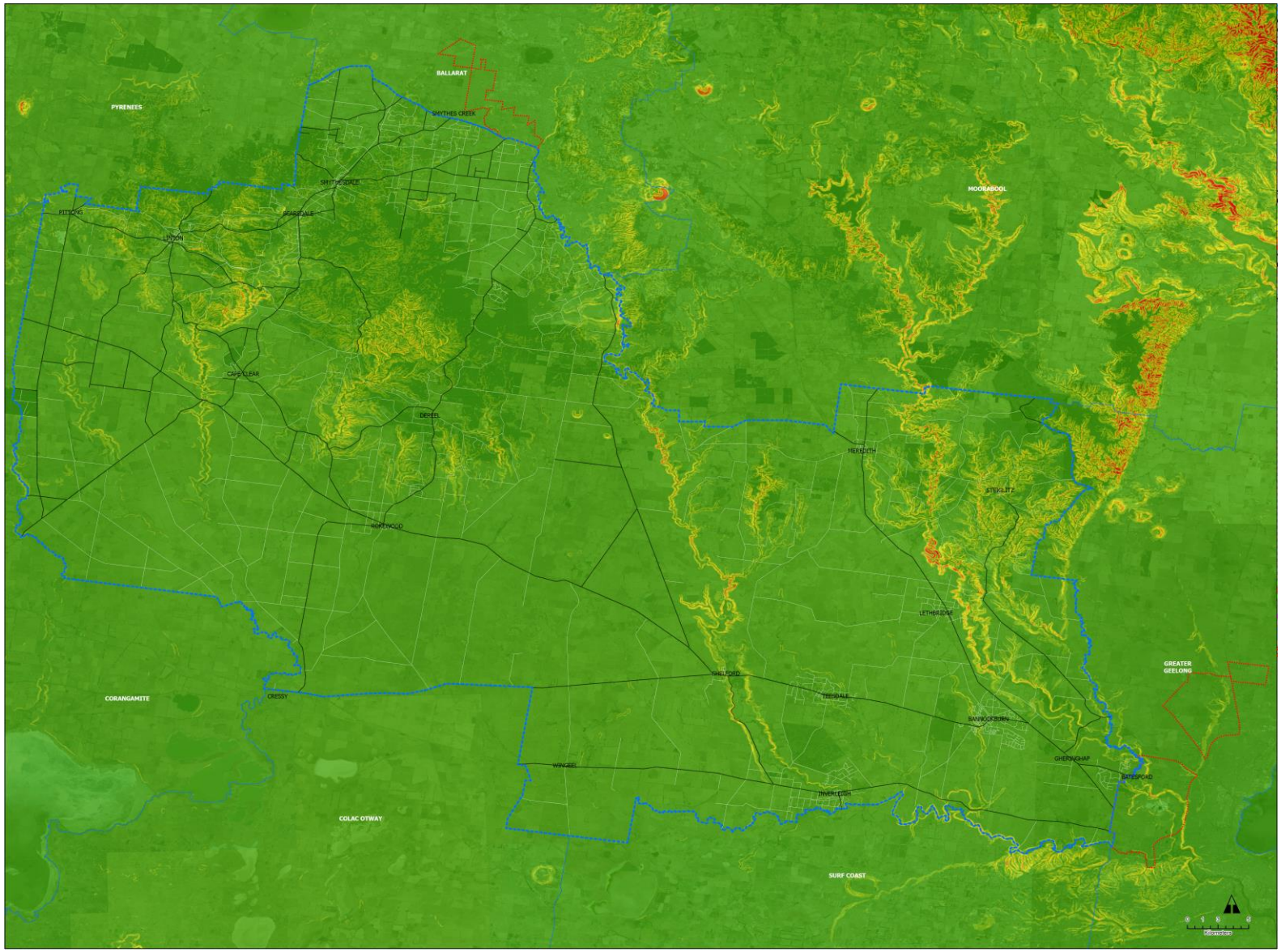


FIGURE 3D : SLOPE BASED IN A 10M CONTOUR



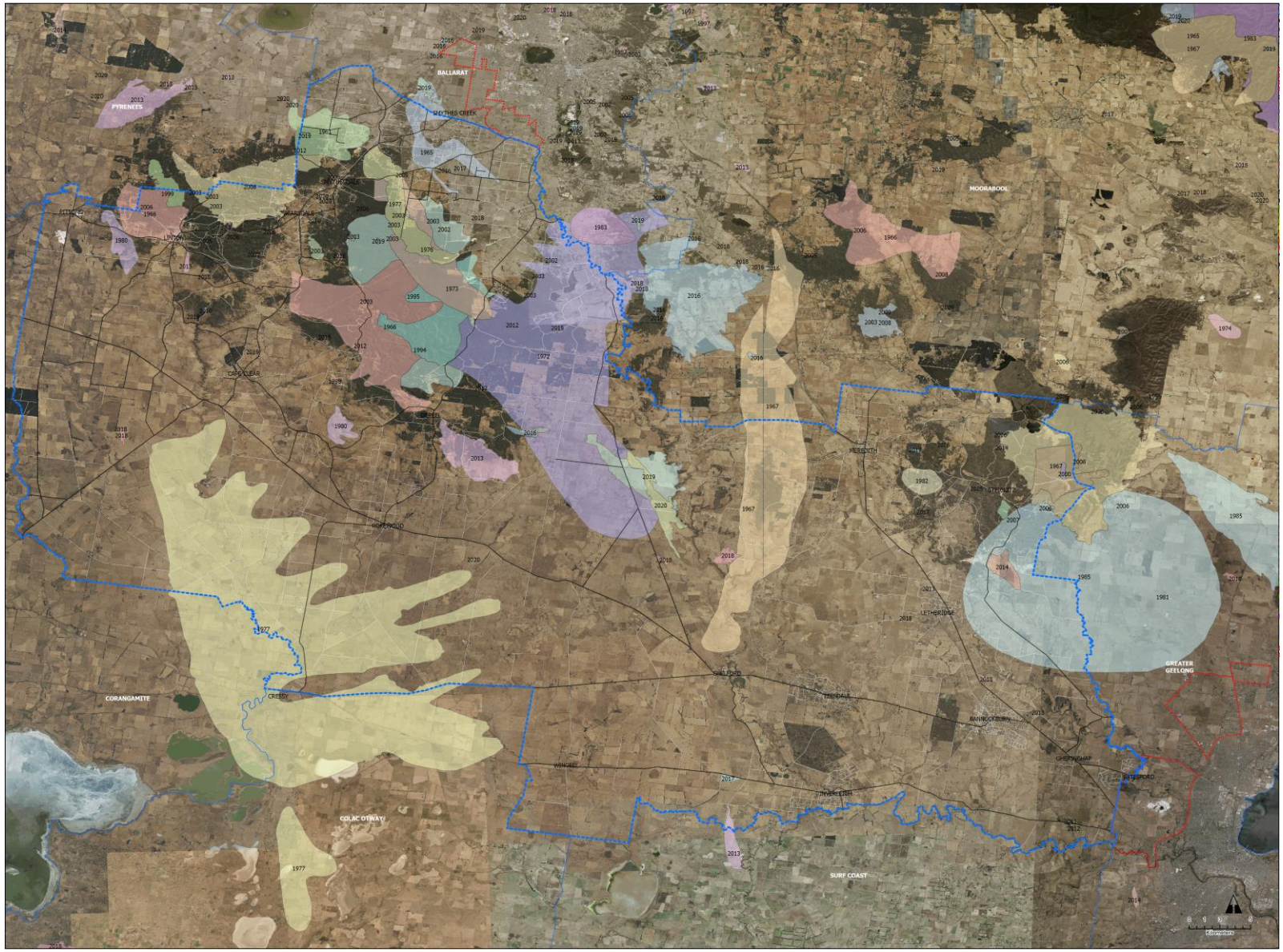
Main study area & Golden Plans Shire

Sub-regional study area - Adjoining growth areas

Slope in degrees

- 0 - 5
- 5 - 10
- 10 - 15
- 15 - 20
- 20 - 25
- 25 - 30
- 30 +

FIGURE 3E: BUSHFIRE HISTORY: BUSHFIRE HISTORY SINCE 1960



Main study area & Golden Plans Shire

Sub-regional study area - Adjoining growth areas

1973 Bushfire Year

Data extracted in 2022

FIGURE 3F: REGIONAL BUSHFIRE PLANNING ASSESSMENT GRAMPIANS REGION (DPCD)

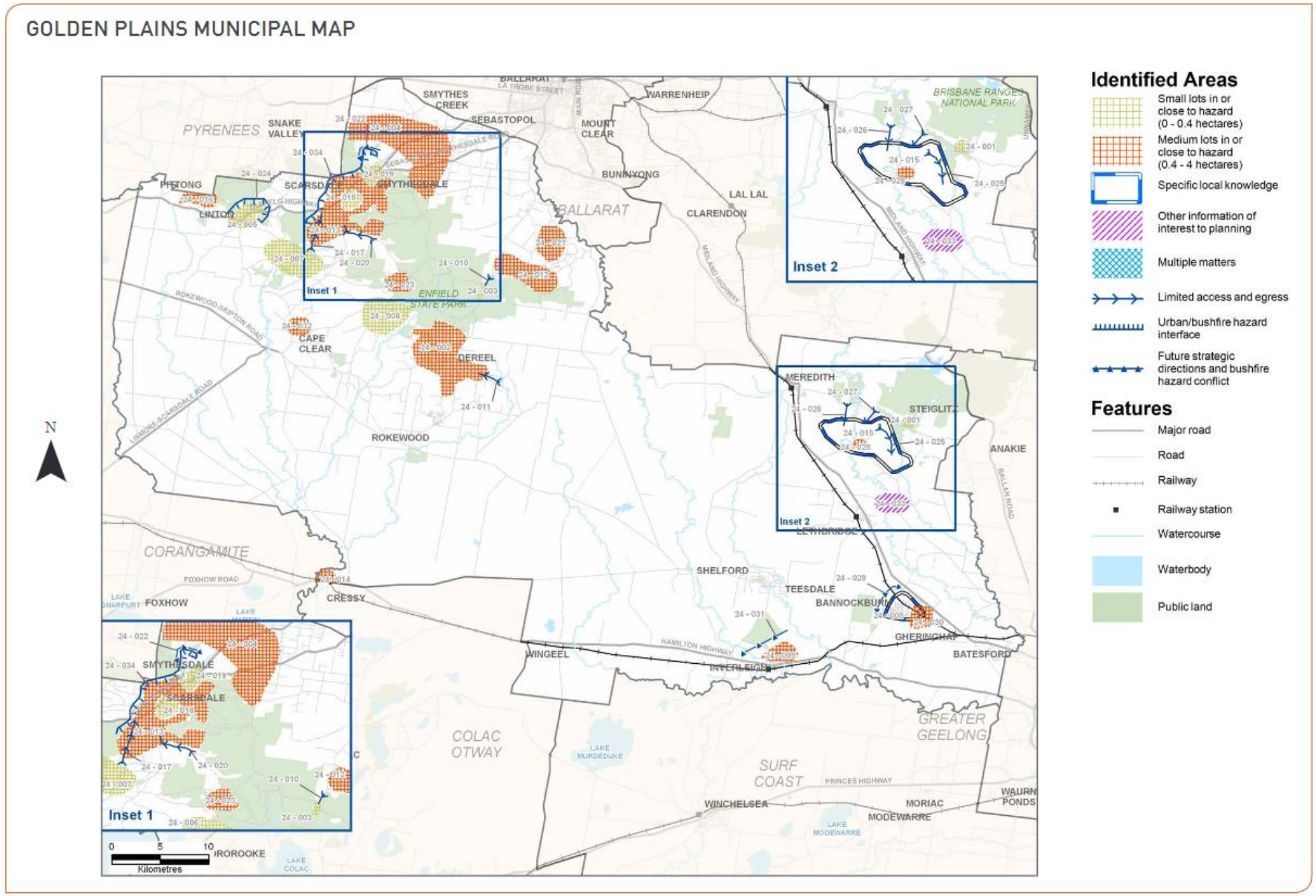


FIGURE 3G: GENERALISED UNDERSTANDING OF HOW BUSHFIRE THREATENS SETTLEMENTS (DEWLP 2019)

Understanding the bushfire threat

Landscape scale bushfire threats

Vegetation, topography and weather conditions are the three major characteristics that contribute to landscape scale bushfire threat.

The intensity and duration of a bushfire is largely influenced by these factors. These broader landscape characteristics strongly impact how a fire is likely to act and its probable size, intensity and destructive power and therefore its level of risk and potential to impact people and safety. In some circumstances the risk from a large bushfire cannot be mitigated, which is why development should be avoided in the areas of highest risk.

How bushfire may threaten a settlement

Bushfires are complex and many factors contribute to their behaviour and the threat they can pose. For the purpose of addressing bushfire through the planning scheme, there are three main factors to be considered at the settlement scale.

1. Flame contact and radiant heat
2. Ember Attack
3. Bushfire 'fuels' in vegetated areas

1. Flame contact and radiant heat

The settlement interface with the bushfire hazard is where a moving bushfire front will create flame contact and radiant heat that are harmful to human life and likely to destroy buildings.

Part 2 of the Guidelines provides direction on how to design the settlement interface to mitigate the impact of flame contact and radiant heat from a moving fire front.

2. Ember attack

Land on the settlement interface and land throughout a settlement may be exposed to ember attack.

Ember attack occurs when small burning twigs, leaves and bark are carried by the wind, landing throughout a settlement and igniting fuel sources. Fuel sources typically include vegetation but can also include buildings and sheds.

When ignited from embers, these fuel sources can generate flame contact and levels of radiant heat that are harmful to human life and can destroy buildings. Ember attack is the most common way that structures catch fire during a bushfire. Refer to Parts 1 & 3 on how to manage the threat from ember attack within a settlement.

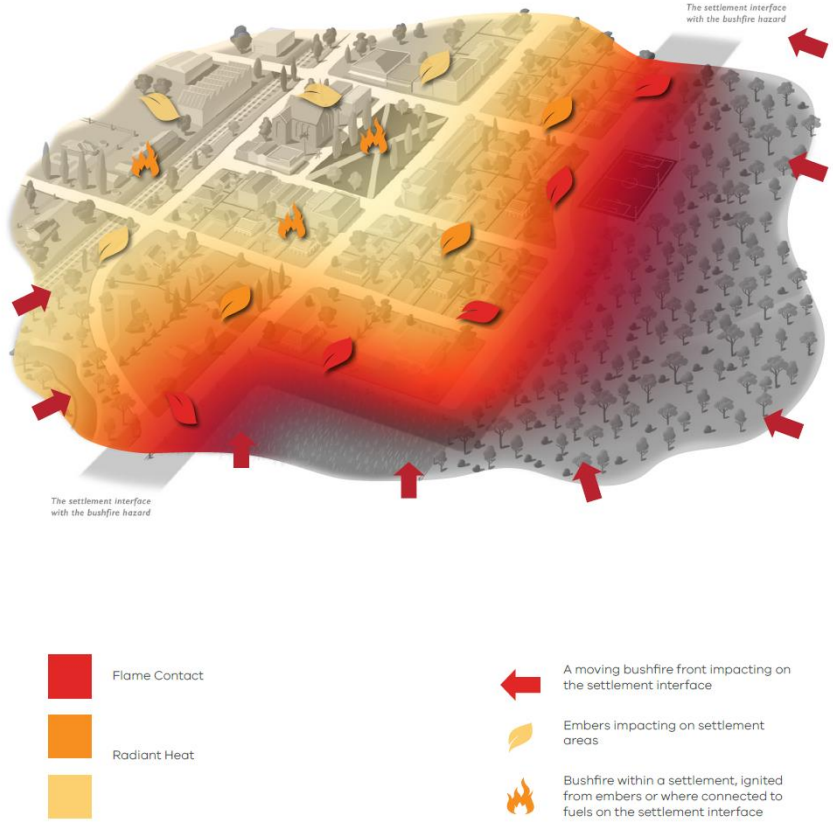
3. Bushfire 'fuels' in vegetated areas

'Fire runs' is the term given to describe how a bushfire will likely 'run' or move through a landscape. Fire runs are fuelled by vegetation and can be ignited where there is a continuous fuel path. This path may be from a forest and lead to a settlement. If the fuels at the interface are not managed it enables deeper penetration of a moving fire front or ember attack potential.

Vegetated areas within a settlement, such as nature reserves, river corridors and areas of remnant vegetation, can create a larger fire run by creating a continuous fuel path within or through a settlement.

Therefore, large vegetated areas may contribute to the fire run potential and therefore the risk to human life.

Refer to 1.4, 2.2, 3.1 and Attachment 1 on how to manage the threat from vegetated areas within a settlement.



4.0 Lower risk settlements on a regional and sub-regional scale

State bushfire policies require low risk locations for settlement growth to consider locations on a regional or sub-regional basis. This supports ensuring that municipal boundaries do not preclude opportunities to direct growth to lower risk locations outside of an individual local government area.

There are three locations most relevant to Golden Plains Shire that function above the municipal scale: Bannockburn within Golden Plans Shire and Ballarat (City) & Geelong (City).

Ballarat and Geelong are strategically significant for Golden Plains Shire. They are large regional cities within which settlements in Golden Plans Shire are, to some extent, satellites of. The transport network reinforces connections to these cities. Planned growth areas in Ballarat and Geelong are located within 1km of the Golden Plains municipal boundary.

This section of the report considers the bushfire characteristics of these three locations.

4.1 Sub-regional locations prioritised for growth

Bannockburn

Bannockburn is the largest centre in Golden Plains Shire. It is identified as a location for growth, including in *c11.01-1R Settlement – Geelong G21* which supports the growth of Bannockburn as a district town and *c02.04 Strategic Framework Plans* which identifies Bannockburn as a sub-regional centre, the only one within Golden Plains Shire.

Local policies enable over 6,000 additional dwellings in Bannockburn, guided by the *Bannockburn Growth Plan 2021*. This directs growth to the west and south-west of the existing settlement.

Geelong

To the south-east of Golden Plains Shire are regionally important growth areas in Geelong. *c11.01-1R Settlement – Geelong G21* recognises central Geelong as a major regional city.

c21.04 Municipal Framework Plan in the Geelong Planning Scheme establishes the Northern Geelong and Western Geelong growth areas which enable an additional 40,000 dwellings, guided by the *Northern and Western Geelong Growth Areas Framework Plan 2020*. There is also growth enabled in Lara West, with 4,000 additional dwellings guided by the *Lara West Precinct Structure Plan 2013*.

Ballarat

To the north-east of Golden Plain Shire are regionally important growth areas in Ballarat. *c11.01-1R Settlement – Central Highlands* recognises Ballarat as the main centre for regional growth.

c21.01 Settlement and Housing in the Ballarat Planning Scheme prioritises the Ballarat West Growth Area and establishes a framework for its development. This is progressed through the *Ballarat West Precinct Structure Plan 2016* which envisages over 14,000 additional dwellings.

Ballarat City Council is currently investigating further increasing the supply of land for urban growth, including through future planning scheme changes. This is likely to increase the supply of additional dwellings, if approved, in close proximity to Golden Plains Shire.

4.2 Appreciation of bushfire in these locations

The three sub-regional locations prioritised for growth share favourable bushfire characteristics that make them lower risk locations on a regional and sub-regional basis. These characteristics include:

- Avoiding landscape-scale bushfire hazards.
- The potential to provide bushfire-optimised interfaces with hazard areas.
- The potential to provide low-fuel areas on the hazard interface which prevents bushfire and grassfire penetrating into developed areas.
- An outcome through planned urban development where people can move away from hazard interfaces by walking 2-3 streets back to places of enhanced safety.

The beneficial bushfire characteristics of these locations is reinforced by most land in these growth areas being sufficient low risk that they are not currently or will not in completed development be included in a bushfire prone area.

These locations in completed development would be capable of being assessed as Landscape type 1 and, possibly, Landscape type 2 where they adjoin neighbourhood or site scale hazards (for example, the western edge of Bannockburn).

4.3 Implications for strategic planning

The presence of these lower risk locations within Golden Plains Shire and very close to Golden Plains Shire provides the opportunity to direct growth on a regional and sub-regional scale to these locations. This is consistent with existing regional and local policies in the three applicable planning schemes.

These locations provide sub-regionally significant supply of land to satisfy a broad range of planning scheme objectives, including an additional 70,000 new dwellings. This will in combination provide a population increase greater than the existing population of Ballarat and more than four times the current population of Golden Plains Shire.

4.4 Bushfire recommendation:

Planning scheme directions that seek to direct growth to Bannockburn are likely to be favourably assessed against locational policies in *c13.02-1S Bushfire Planning.* Bannockburn compliments Ballarat and Geelong as sub-regionally significant locations optimised for growth based on bushfire factors.

Other parts of this report consider settlement-scale factors relating to Bannockburn.

FIGURE 4A: LOWER RISK SETTLEMENTS ON A REGIONAL AND SUB-REGIONAL SCALE

Main study area & Golden Plans Shire

Sub-regional study area - Adjoining growth nodes

Road

Lower-risk locations for growth on a regional and sub-regional scale

Boundaries shown on this plan are schematic only and should not be scaled to property boundaries

5. Lower landscape risk locations

This section describes the locations which are at the lower-end of the landscape risk spectrum using the landscape type approach.

5.1 Settlements with land not included in a bushfire prone area

There are settlements in Golden Plains Shire where the risk is sufficiently low that land is not included in a bushfire prone area. This means the planning scheme already confirms there is insufficient hazard and insufficient risk to warrant any pre-designation of these areas as being exposed to bushfire or grassfire. These areas are also capable of being defined as BAL:Low areas.

These locations comprise parts of Bannockburn and Inverleigh (south).

A key strength is that locations on the edges of these settlements that may be included in the bushfire prone area (or the Bushfire Management Overlay) have good access to the core of the settlement where protection from bushfire is available. This will often be by walking 2-3 streets back from the settlement / hazard interface.

Planning scheme directions that seek to direct growth to Bannockburn and Inverleigh (south) are likely to favourably assessed against locational policies in *c13.02-1S Bushfire Planning on the basis that they have land not included in a bushfire prone area.*

See **Figure 5A: Settlements with land not included in a bushfire prone area**

5.2 Landscape type 1 areas

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 comprises locations predominantly in grassland areas but only where there are not strongly influenced by:

- Landscape-scale areas of forest in the north and north-east of the Shire; or
- Settlement-scale areas of forest or woodland in other parts of the Shire.

Landscape type 1 includes the settlement of Inverleigh south of the River Leigh. It also includes grassland areas within Golden Plains Shire north of Cressy.

Grassfires can be very dangerous, with bushfire history recording many grassfires in these areas being driven by north-west winds following by a south-westerly wind change. Grassfire can approach settlements with a wide fire front, and where hazard edges are not well defined penetration into settlement areas or grassfire approach a development may arise.

Conversely, the Landscape type 1 areas have characteristics that include:

- Avoiding landscape-scale bushfire hazards.
- The potential to provide bushfire-optimised interfaces with grassland areas in conjunction with new development, including features such as perimeter roads.
- There being land available beyond the grassland hazard interfaces of settlements where enhanced safety from grassfire can be obtained. This is typically achieved by walking away from grassland hazard edges deeper into settlement areas or accessing low-fuel land.

In Landscape type 1 locations there may continue to be neighbourhood and site scale hazards such as bushland reserves and riparian corridors. These will be relevant hazards to consider in neighbourhood and site-scale planning. But they are not hazards of landscape significance.

<u>Appreciation of policy for landscape type 1 locations</u>

Planning scheme directions that seek to direct growth to Landscape type 1 locations are likely to be favourably assessed against locational policies in *c13.02-1S Bushfire Planning.*

See **Figure 5B: Landscape type 1 areas**

5.3 Landscape type 2 areas

Landscape type 2 is described by DELWP (2017) as follows:

- *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.*

A range of locations are assessed within Landscape type 2.

Locations influenced by landscape-scale areas of forest

Locations between 1km and 3km of the landscape-scale areas of forest in the north and north-east of the Shire. In these areas, there is potential for increased ember-ignited grassfires and multiple grassfires as bushfire moves out of the forest.

The assessment of these Landscape type 2 locations does not account for aspect. Locations east of landscape-scale hazards are more at risk than those located to the west of hazards under Victoria's dominant bushfire weather. However, there are no settlements in Golden Plains Shire affected by not accounting for aspect that would result in them being assessed as a lower landscape type.

Land with 150m of the western hazard interface of Bannnockburn

Bannockburn is the largest settlement in Golden Plains Shire and is prioritised for growth in the planning scheme. The *Bannockburn Growth Plan 2021* outlines that the settlement has been one of the fastest growing regional areas over the past 15 years and population is planned to more than double through planned growth over the next 30 years.

The planning for growth in Bannockburn has recently been implemented through Amendment C94 to the planning scheme that introduced the strategic directions contained in the *Bannockburn Growth Plan 2021*.

Planned growth areas in Bannockburn interface to the west with a 500ha reserve. The analysis in Section 3 identified this hazard as being of settlement and local influence relative to the large, landscape areas of forest in the northern part of the Shire. Due to the fuel levels and lack of slope, extreme bushfire behaviour is unlikely. High levels of radiant heat are to be expected at the hazard interface along with ember attack most likely to occur up to 100-150m around the hazard.

Planning scheme directions enable growth to adjoin this area of hazard, with the *Bannockburn Growth Plan 2021* emphasising the need for effective interface treatments to be integrated in subdivision design. The Bushfire Management Overlay which applies to areas up to 150m around the hazard will support this occurring by:

- Require land within 150m of the hazard edge to be managed to bushfire vegetation standards. This outcome will enable a low-fuel interface to arise and will enable people to move 2-3 streets back from the hazard to a place of enhanced safety.
- A perimeter road being provided separating the hazard from low-fuel developed areas.
- Bushfire construction standards to mitigate the effects of radiant heat and ember attack.
- Other standard measures specified in *c53.02 Bushfire Planning.*

Landscape type 2 is assessed on the western interface of Bannockburn on the basis of existing planning scheme content which will deliver a Landscape type 2 outcome in completed development.

Appreciation of policy for landscape type 2 locations

Planning scheme directions that seek to direct growth to Landscape type 2 locations are likely to be favourably assessed against locational policies in *c13.02-1S Bushfire Planning.*

See **Figure 5B: Landscape type 2 areas**

5.4 Focus for future strategic planning

Lower landscape risk areas such as Landscape type 1 and 2 locations are not unhindered by bushfire considerations, they are simply more optimised to satisfy planning scheme bushfire policies.

It will be important that bushfire is considered at the settlement, neighbourhood and structure planning stage to ensure the full suite of bushfire policy and considerations are applied. This will be especially important for land outside of the Bushfire Management Overlay where the requirements in *c53.02 Bushfire Planning* would not routinely apply.

Particularly important factors to consider include:

- Ensuring effective interfaces with bushfire hazards to prevent a moving bushfire entering settlement areas. Perimeter roads are likely to be necessary to achieve this.
- Ensuring that existing low fuel areas are not compromised by revegetation and continue to be available to support resilience, especially where they provide safer places for people to move to in the event of a bushfire or grassfire.
- Planning scheme barriers to implementing bushfire vegetation requirements (and creating defendable space) are avoided or minimised.
- Vulnerable uses are further considered, including how future occupants can be managed before, during and after a bushfire, including through bushfire emergency management planning being deployed.
- The potential for localised burning elements, including structure to structure fires, are managed (including through bushfire construction standards being applied in bushfire prone areas).

Bushfire protection measures in *c53.02 Bushfire Planning* are likely to be important to demonstrate in structure planning that the risk to human life is acceptably managed. This is likely to include the need for structure plans to consider and deliver:

- A defined permanent hazard edge to settlements comprising:
    - A perimeter road being provided separating the hazard from low-fuel developed areas; and
    - Bushfire vegetation standards applied to prevent a moving bushfire entering new settlement areas.
- Using bushfire vegetation standards or the typology of development (where lots are less than 1,8000sq.m) to provide a low-fuel area which will enable people to move 2-3 streets back from the hazard to a place of enhanced safety.
- Bushfire construction standards to mitigate the effects of radiant heat and ember attack.

Design Guidelines: Settlement Planning at the Bushfire Interface (DELWP 2020) provides guidance on implementing bushfire optimised outcomes.

FIGURE 5A: SETTLEMENTS WITH LAND NOT INCLUDED IN A BUSHFIRE PRONE AREA

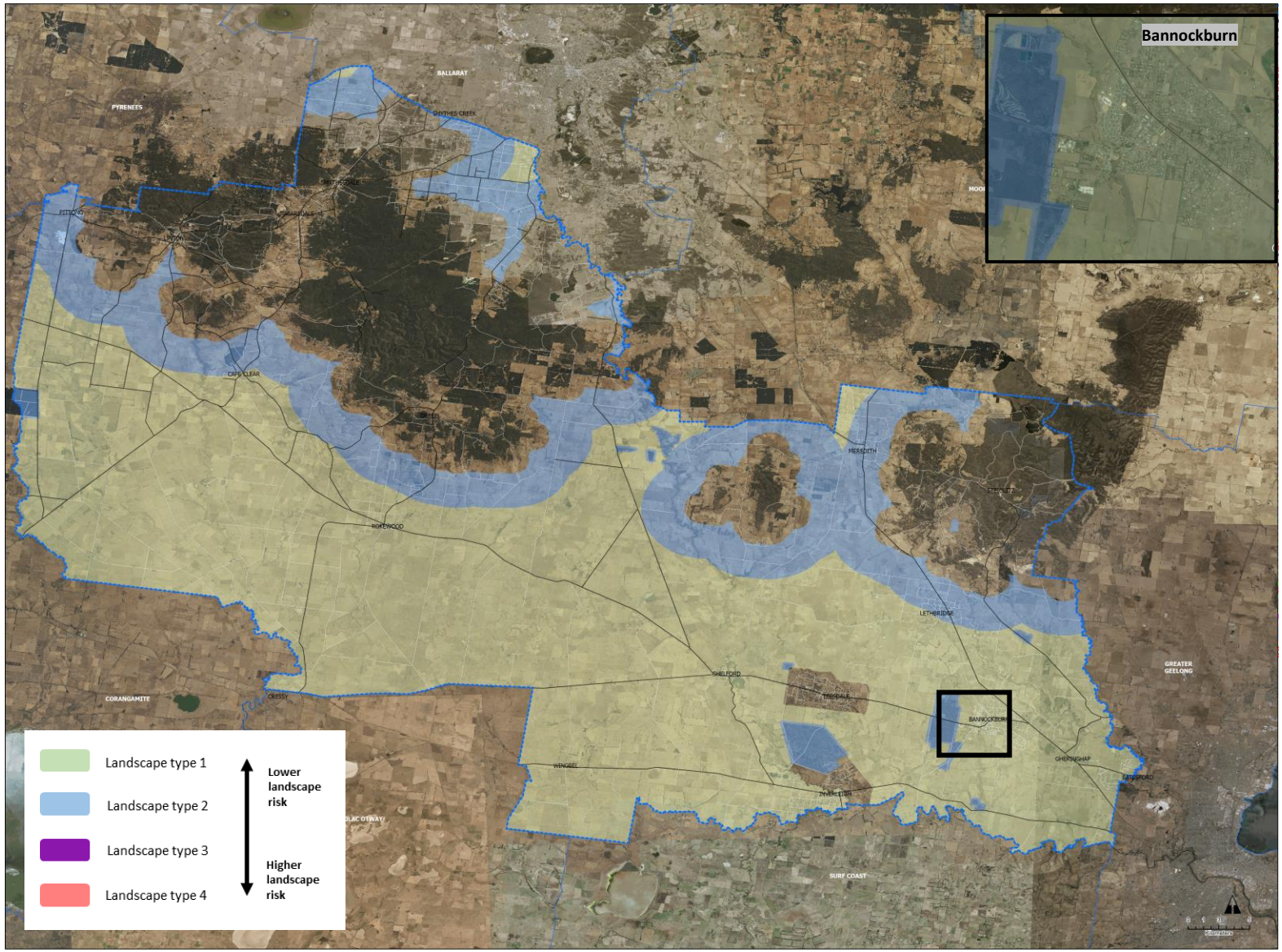
Main study area & Golden Plans Shire

Road

Settlements with land not included in a bushfire prone area

Boundaries shown on this plan are schematic only and should not be scaled to property boundaries

FIGURE 5B: LANDSCAPE TYPE 1 & 2 LOCATIONS



Main study area & Golden Plans Shire

Road

Landscape type 1

Landscape type 2

Boundaries shown on this plan are schematic only and should not be scaled to property boundaries

6. Moderate landscape risk locations – Inverleigh (north) and Teesdale

Inverleigh and Teesdale are located in the southern part of Golden Plains Shire. The broader landscape is dominated by grasslands and there are no landscape-scale hazard areas in proximity to either settlement. They are however exposed to neighbourhood-scale hazards, which elevates their bushfire risk. The nature of risk varies within each settlement.

c11.01-1R Settlement – Geelong G21 supports growth in Inverleigh and Teesdale, including by graphically representing areas for planned growth to the north-east of Teesdale and in various places around Inverleigh. Both settlements have existing local policies supporting these changes.

6.1 Landscape type 3 locations

Landscape type 3 is described by DELWP (2017) as follows:

- *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 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*

Inverleigh (north)

Neighbourhood-scale hazards in Inverleigh comprise the Inverleigh Flora Reserve and elevated fuels north of the Leigh River arising from its low-density character.

The Inverleigh Flora Reserve and other treed land is 1,000ha in size. Due to the fuel levels and lack of slope, extreme bushfire behaviour is unlikely. High levels of radiant heat are to be expected at the hazard interface along with ember attack most likely to occur up to 100-150m around the hazard.

Elevated fuels arise in the low-density part of Inverleigh, north of the Leigh River. There is vegetation not capable of being assessed as low-threat (or low fuel) throughout low-density lots. These cannot reliably be assessed as low-threat, meaning they are a bushfire hazard.

Where a bushfire in the Inverleigh Flora Reserve or grassfire impacts on the edges of the low-density parts of Inverleigh, there are sufficient fuels where it may penetrate deep into settlement areas. This would arise in a direction most likely on the north-west, west and south-west interfaces under dominant bushfire weather.

Parts of Inverleigh south-west of the Leigh River within the Township Zone are low-fuel. These areas are well located to support safer outcomes for development on that side of the river, supported by them being assessed as Landscape type 1 in earlier parts of this report. However, they are less beneficial to areas north of the River Leigh where travel to the core can be up to 2km. Unlike, for example Bannockburn, there are limited areas north of the Leigh River where walking 2-3 streets would access a place of enhanced safety.

Teesdale

Neighbourhood-scale hazards in Teesdale comprise elevated fuels across the settlement arising from its low-density characteristics. There is vegetation throughout low-density lots and within public reserves. These cannot reliably be assessed as low-threat, meaning they are a bushfire hazard.

Where grassfire impacts on the edges of Teesdale, there are sufficient fuels where it may penetrate deep into settlement areas. Grassfire would be most likely on the north-west, west and south-west interfaces under dominant bushfire weather.

The small core of Teesdale within the Township Zone is low-fuel and provides for enhanced protection. This is not an insignificant feature of the settlement but is somewhat less beneficial to outer areas of Teesdale where travel to the core can be many hundreds of metres. Unlike, for example Bannockburn, there are limited areas where walking 2-3 streets would access a place of enhanced safety.

6.2 Considerations

Inverleigh north of the Leigh River and Teesdale afford diminished bushfire safety despite not being exposed to landscape-scale hazards. This arises from the dominant typology of land being low-density residential that carry higher fuel loads. These areas are not managed in a low fuel condition. There is no certainty that a moving grassfire or bushfire would not penetrate deep into settlement areas.

Access to low fuel areas is variable in Teesdale, complicated by Don Wallace Reserve central to the town. For Inverleigh (north) it is not readily accessible due to the travel distances and single access to cross the river.

There remains the potential for neighbourhood scale destruction throughout these areas. Survivability and the ability to move away from bushfires is not certain and will be complex before, during and after a bushfire event. There is not typically immediate access to low fuel areas where protection from the harmful effect of bushfire is provided.

Teesdale and Inverleigh north of the Leigh River are relatively higher risk locations. They are cumulatively disadvantaged from a bushfire policy perspective by their proximity to lower risk areas in Bannockburn and Inverleigh (south of the Leigh River) which are at a lower landscape risk and better optimised for development.

Despite the higher fuels in and around Inverleigh (north) and Teesdale, they do avoid landscape-scale bushfire hazards. They are clearly at less risk than settlements in and around forested areas in Golden Plains Shire. Their elevated landscape risk is driven by the lack of low fuel areas and credible shelter options. These deficiency can be the focus of future planning activities (see below).

Where new development is accompanied by low-fuel areas capable of being assessed as BAL:Low and where higher fuel loads are not permitted to remain or arise, they would enable new developed areas in Inverleigh (north) and Teesdale to be assessed as Landscape type 2.

6.2 Appreciation of policy for landscape type 3 locations in Inverleigh (north) and Teesdale

Planning scheme directions that seek to direct growth to Inverleigh (north) and Teesdale where planning scheme requirements deliver low-fuel outcomes and an area of BAL:Low are likely to be favourably assessed against locational policies in *c13.02-1S Bushfire Planning.*

Future planning should be focused on reducing the bushfire risk so it accords with a Landscape type 1 or 2 location. Where achieved in new development, this is likely to afford protective benefits for existing settlement areas.

See **Figure 6A: Landscape type 3 locations in Inverleigh (north) and Teesdale**

6.3 Focus for future strategic planning

It will be important that bushfire is considered at the settlement, neighbourhood and structure planning stage to ensure the full suite of bushfire policy and considerations are applied. This will be especially important for land outside of the Bushfire Management Overlay where the requirements in *c53.02 Bushfire Planning* would not routinely apply, which is the case for most of Teesdale and Inverleigh (north).

Particularly important factors to consider include:

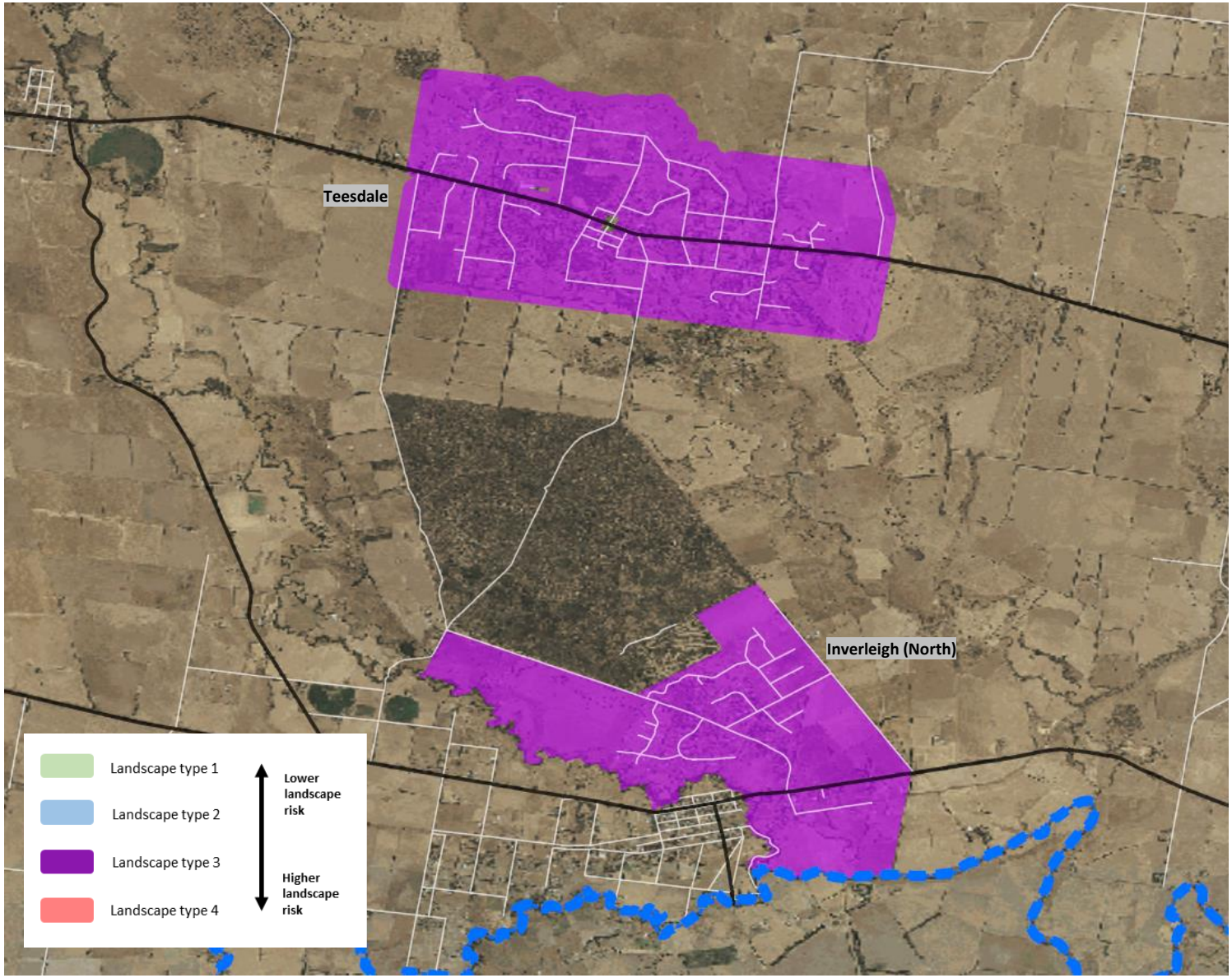
- Ensuring effective interfaces with bushfire hazards to prevent a moving bushfire entering settlement areas. Perimeter roads are likely to be necessary to achieve this.
- Ensuring that existing low fuel areas are not compromised by revegetation and continue to be available to support resilience, especially where they provide safer places for people to move to in the event of a bushfire or grassfire.
- Planning scheme barriers to implementing bushfire vegetation requirements (and creating defendable space) are avoided or minimised.
- Vulnerable uses are further considered, including how future occupants can be managed before, during and after a bushfire, including through bushfire emergency management planning being deployed.
- The potential for localised burning elements, including structure to structure fires, are managed (including through bushfire construction standards being applied in bushfire prone areas).

Bushfire protection measures in *c53.02 Bushfire Planning* are likely to be important to demonstrate in structure planning that the risk the human life is acceptably managed. This is likely to include the need for structure plans to consider and deliver:

- A defined permanent hazard edge to settlements comprising:
    - A perimeter road being provided separating the hazard from low-fuel developed areas; and
    - Bushfire vegetation standards applied to prevent a moving bushfire entering new settlement areas.
- Using bushfire vegetation standards or the typology of development (where lots are less than 1,800sq.m) to enable a low-fuel area to arise which will enable people to move 2-3 streets back from the hazard to a place of enhanced safety.
- Bushfire construction standards to mitigate the effects of radiant heat and ember attack.

Design Guidelines: Settlement Planning at the Bushfire Interface (DELWP 2020) provides guidance on implementing bushfire optimised outcomes.

FIGURE 6A: LANDSCAPE TYPE 3 LOCATIONS IN INVERLEIGH (NORTH) AND TEESDALE



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7. Higher landscape risk locations – Landscape type 3

This section describes parts of Smythesdale and Linton which are at the upper-end of the landscape risk spectrum using the landscape type approach.

7.1 Landscape type 3 locations

Landscape type 3 is described by DELWP (2017) as follows:

- *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 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*

Locations in Smythesdale and Linton with immediate access to low-fuel areas are included in landscape type 3. They reflect the seperation from forest edges and that the settlement setting affords some protection from some forms of bushfire attack. However, any safer locations may involve sheltering in the open air during high levels of ember attack and movement outside of the landscape involves travel through forested areas.

See **Figure 7A: Landscape type 3 areas**

7.2 Appreciation of policy for landscape type 3 locations

It is difficult to justify directing growth to these settlements as there are alternative locations for growth available. This includes alternatives for urban growth and growth associated with larger lots (RLZ, LDRZ) that can be accommodated outside of this landscape and where not exposed to landscape-scale hazards.

Smythesdale and Linton are less favourably assessed against *c13.02-1S Bushfire Planning.* They are higher landscape risk locations.

Planning scheme directions that seek to direct growth to Landscape type 3 areas in Smythesdale and Linton are unlikely to be favourably assessed against locational policies in *c13.02-1S Bushfire Planning.*

Growth and development directed to these locations could be enabled where a planning scheme amendment was able to demonstrate that there was no net increase in risk and that bushfire risk overall was reduced, as required by *c13.02-1S Bushfire Planning*.

The following options could be further explored.

Option A: Limited growth and stop

Smythesdale and to a lesser extent Linton have bushfire hazards throughout their settlements, even though they beneficially contain a low fuel area in their core. This means there is not a clearly defined hazard edge and moving bushfires can penetrate deeper into settlements areas.

Structure planning directed to identifying key sites and locations where planning scheme initiatives can create or reinforce a hazard edge to the settlement could provide a protective benefit to existing settlement areas. These initiatives may also be accompanied by non-planning scheme proposals to create lower fuel areas and a better defined edge to hazards (for example, fuel breaks on public land).

Locations for limited growth would need to enable any future occupiers to walk to existing low-fuel areas in the core of each settlement. Locations for growth would therefore be optimised where contiguous or very close to existing low fuel areas.

Where limited growth was enabled to harden up the edge of these settlements, in combination with planning scheme changes that directed no further growth beyond this, an argument could be made that may be favourably assessed against the locational policies in *c13.02-1S Bushfire Planning.*

Option B: Reallocate existing planning scheme enabled growth

Smythesdale and Linton are in proximity to large areas of land in a Rural Living Zone and Low Density Residential Zone. These Zones have been enabling and will continue to enable additional dwellings and subdivision to arise, incrementally increasing the bushfire risk over time in an unplanned manner and largely relying on planning scheme settings developed prior to contemporary bushfire policy (pre-2011).

Many larger lots in the wider landscape are at an extreme risk and included in Landscape type 4. Incremental changes under current planning scheme settings have generally been supported by the Council and the Country Fire Authority through the issuing of planning permits.

A planning scheme approach could re-allocate existing planning scheme enabled development from locations outside of core settlement areas to locations within Smythesdale and Linton. This would in effect move the location for some development from a Landscape type 4 area to a Landscape type 3 area.

It would be advantageous in this landscape for growth to be directed to settlements with a low-fuel area and where this arose from reallocating higher risk development, an argument could be made that may be favourably assessed against in *c13.02-1S Bushfire Planning* by delivering an overall risk reduction.

Option C: Enhanced resilience for new development

The Bushfire Management Overlay does not consistently apply to areas identified as Landscape type 3, including the core settlement areas of Smythesdale and Linton (and Scarsdale also). This means that Bushfire Management Overlay required outcomes are not routinely provided, including:

- The creation of low-fuel areas, bushfire water supply and construction standards responsive to the landscape risk.
- The use of site operations for non-residential uses to reduce the bushfire risk (for example, closure on forecast high risk bushfire days).
- For subdivision, in addition to the above, bushfire-responsive lot layout, perimeter roads and consideration of access to low fuel areas.

The above would be highly beneficial in these Landscape type 3 areas.

Where tailored bushfire protection measures were applied based on landscape conditions and irrespective of where the Bushfire Management Overlay applies, an overall risk reduction may arise. This is because enhanced resilience would apply to existing planning scheme enabled development in addition to new growth.

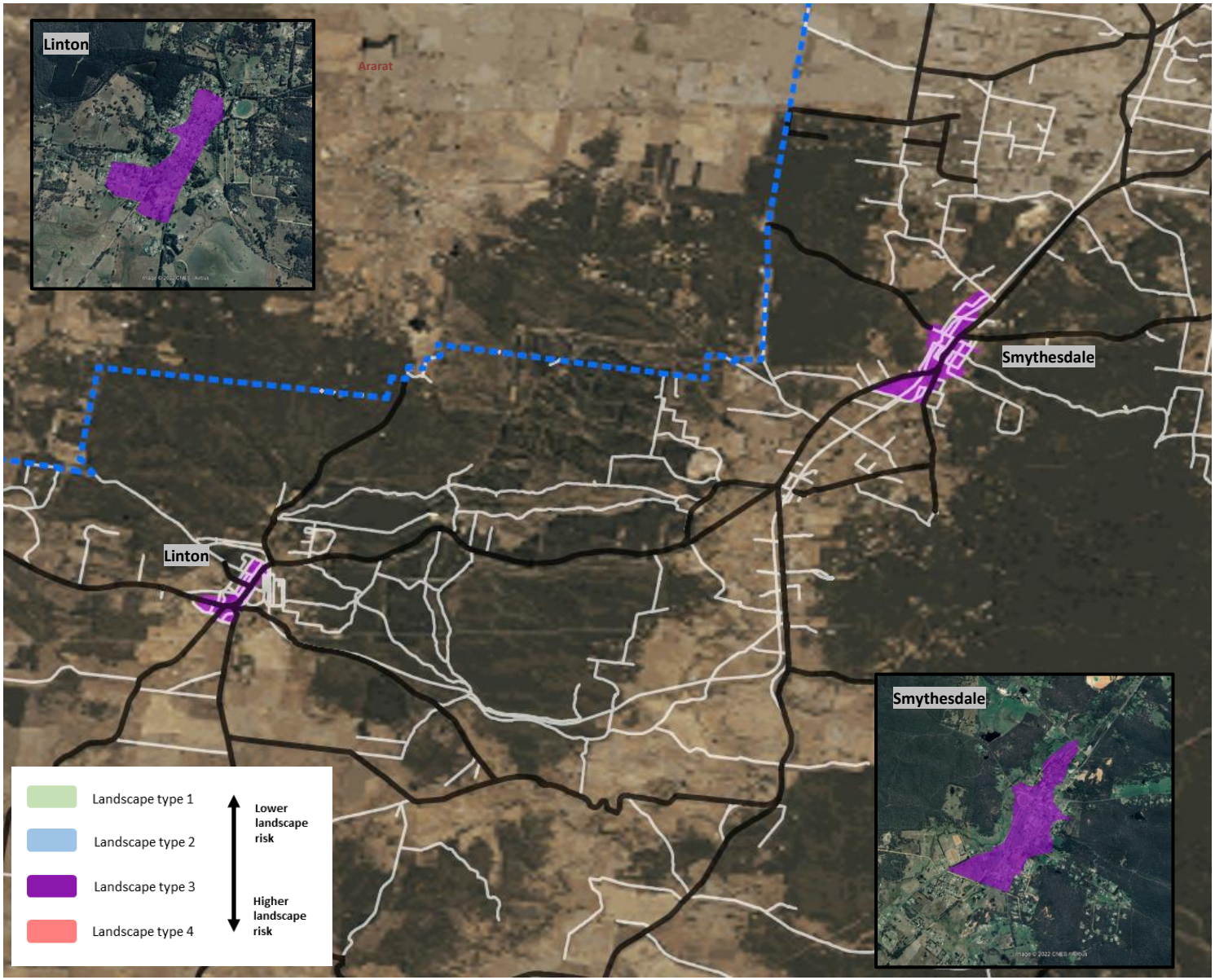
This risk reduction, whilst hard to quantify, may enable some limited growth to be enabled within these areas. Limited growth may, for example, involve 20-50 new dwellings to put some scale on what is intended in Option C.

7.3 Structure planning process

It would be reasonable for the Council to further consider development through a structure planning process (or similar) that enables settlement scale bushfire issues to be addressed. This would include expectations on permanent hazard edges, the phasing of development, interventions to be undertaken outside of the planning system to better manage bushfire risks (for example, through fire prevention planning) and a strategic approach to shelter options, including where low fuel areas may arise in completed development.

Such a process would enable the community and the Country Fire Authority to assist in determine whether any of the options canvassed in this section represent a viable planning scheme approach.

FIGURE 7A: LANDSCAPE TYPE 3 LOCATIONS (SMYTHESDALE AND LINTON)



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8. Higher landscape risk locations – Landscape type 4

This section describes the locations which are at the highest end of the landscape risk spectrum using the landscape type approach.

8.1 Landscape type 4 areas

Landscape type 4 is described by DELWP (2017) as follows:

- *The broader landscape presents an extreme risk*
- *Bushfires may have hours or days to grow and develop before impacting*
- *Evacuation options are limited or not available*

Settlements in or close to forested areas

The northern parts of Golden Plains Shire includes settlements within or in proximity to large areas of forests. These forests are of landscape significance on a sub-regional and regional scale from a bushfire respective.

Settlements in these areas include Enfield, Haddon, Ross Creek and Deveel. They also include lower-density residential development that forms an arc to the north and north-east of the forest hazards.

Moving bushfire fronts and ember attack are likely in these areas. They include large areas that are not managed in a low fuel condition. Larger fires and neighbourhood scale destruction from bushfires are likely to arise in these areas.

The ability for people to move away from hazardous areas is not certain, meaning people may need to shelter on their own land or they may have limited shelter options or no shelter options.

These areas can generally be defined as areas within or within 150m of forested areas. These areas will be extensively within the Bushfire Management Overlay and within a bushfire prone area.

In generally, it is difficult to sustain directing development to these locations given the landscape risk that exists, the lack of shelter options and the availability of alternative locations for lower risk growth and development.

Grassland areas in proximity to landscape scale forest areas

Locations between 150m to 1km of the landscape-scale forested areas. As any bushfire moves out of the forest extreme bushfire behaviour is to be expected, including high levels of ember attack. Ember attack is likely to ignite multiple grassfires in conjunction with bushfires.

These grassland areas are included in this elevated landscape type as movement further away from the forest edge may be problematic, meaning access to safer areas is not certain. Sheltering within a location is to be anticipated rather than moving to relatively safer areas.

See **Figure 8A: Landscape type 4 areas**

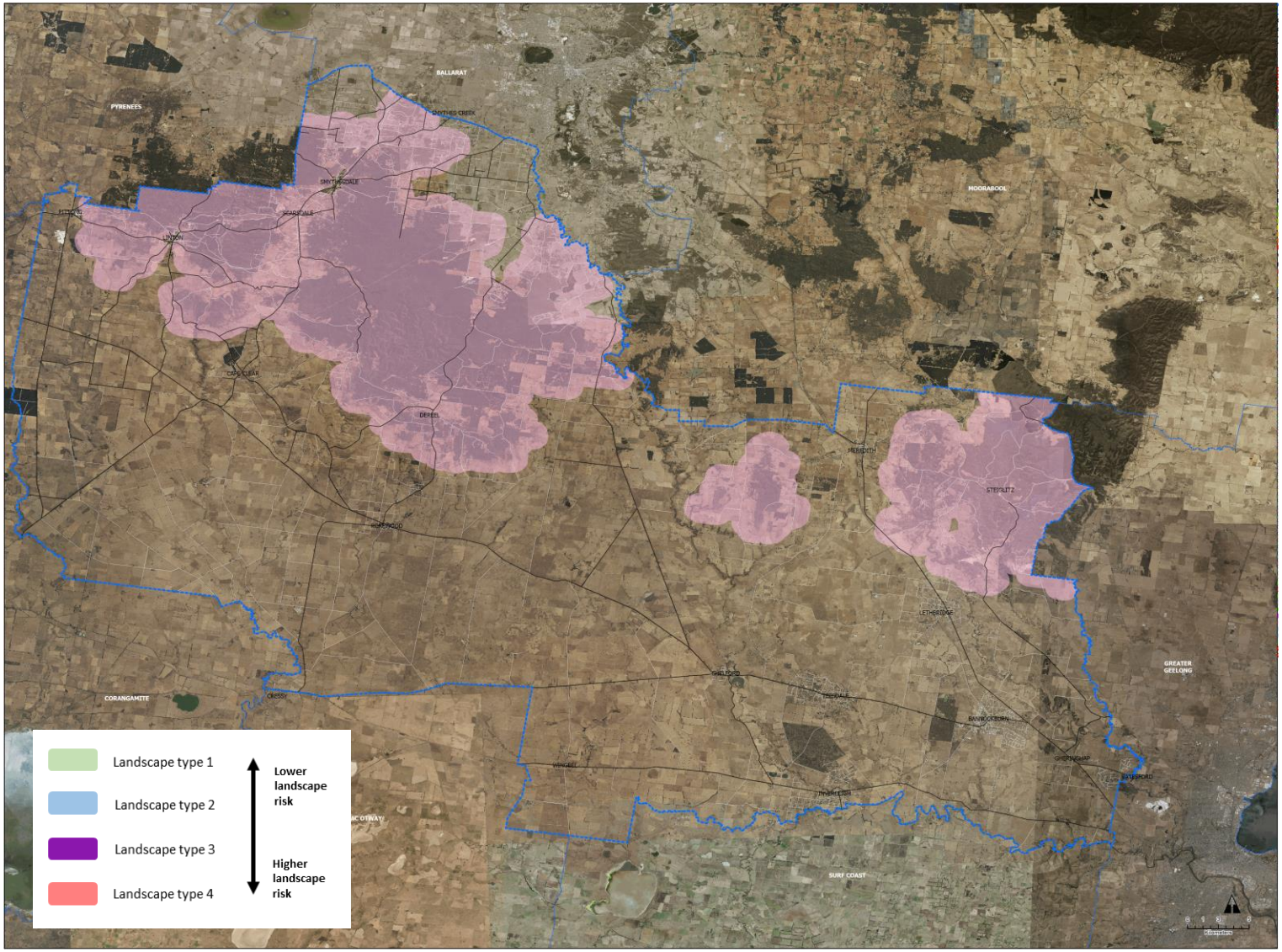
8.2 Appreciation of policy for landscape type 4 locations

New planning scheme proposals that seek to direct growth to locations such as these are likely to be unfavourably assessed against locational policies in *c13.02-1S Bushfire Planning.*

For non-residential uses, it is reasonable that further investigations be made primarily directed to whether planning permit conditions requiring emergency management planning interventions and facilities to be closed on a broad range of high risk bushfire days would significantly reduce the bushfire risk to a level that would warrant some proposals proceeding.

This may, for example, include facilities to serve existing communities, visitor facilities or activities on public land where a public land manager is able to implement on-going emergency management activities. In other regions, there is precedent for development in Landscape type 4 areas proceeding. For example, within Alpine Resorts and in National Parks.

FIGURE 8A: LANDSCAPE TYPE 4 LOCATIONS



Main study area & Golden Plans Shire

Road

Landscape type 4

Whilst not visible at the scale of this map, parts of Smythesdale and Linton are assessed as Landscape type 3. See Section 7 for a discussion on these locations.

Boundaries shown on this plan are schematic only and should not be scaled to property boundaries

9. Recommendations in response to *c13.02-1S Bushfire Planning* locational policies

Based on the assessments in this report, it is possible to provide high-level recommendations to inform the development of new planning scheme content having regard to locational policies in *c13.02-1S Bushfire Planning*.

These recommendations are preliminary pending the further development of the bushfire evidence base and the emergence of specific proposals being considered for inclusion into new planning scheme content.

Recommendation 1: Locations for growth and development

The following locations are suitable to direct development from a bushfire perspective:

- Land not included in a Bushfire prone area.
- Land identified within Landscape type 1 or Landscape type 2.

Recommendation 2: Locations requiring further assessment

Landscape type 3 areas require further investigation before new planning scheme proposals direct development to these areas. The investigations could consider:

- Whether development can be made further bushfire resilient through tailored bushfire protection measures. This is irrespective of whether land is within or outside of the Bushfire Management Overlay.
- Whether there are areas of BAL:Low already existing or capable of being created in conjunction with new development or by the Council.
- How the use of closure of non-permanently occupied development on higher risk bushfire days could manage the bushfire risk.
- The options discussed in this assessment for Linton and Smythesdale that may demonstrate no net increase in risk overall and which could enable additional development to be directed to these settlements.

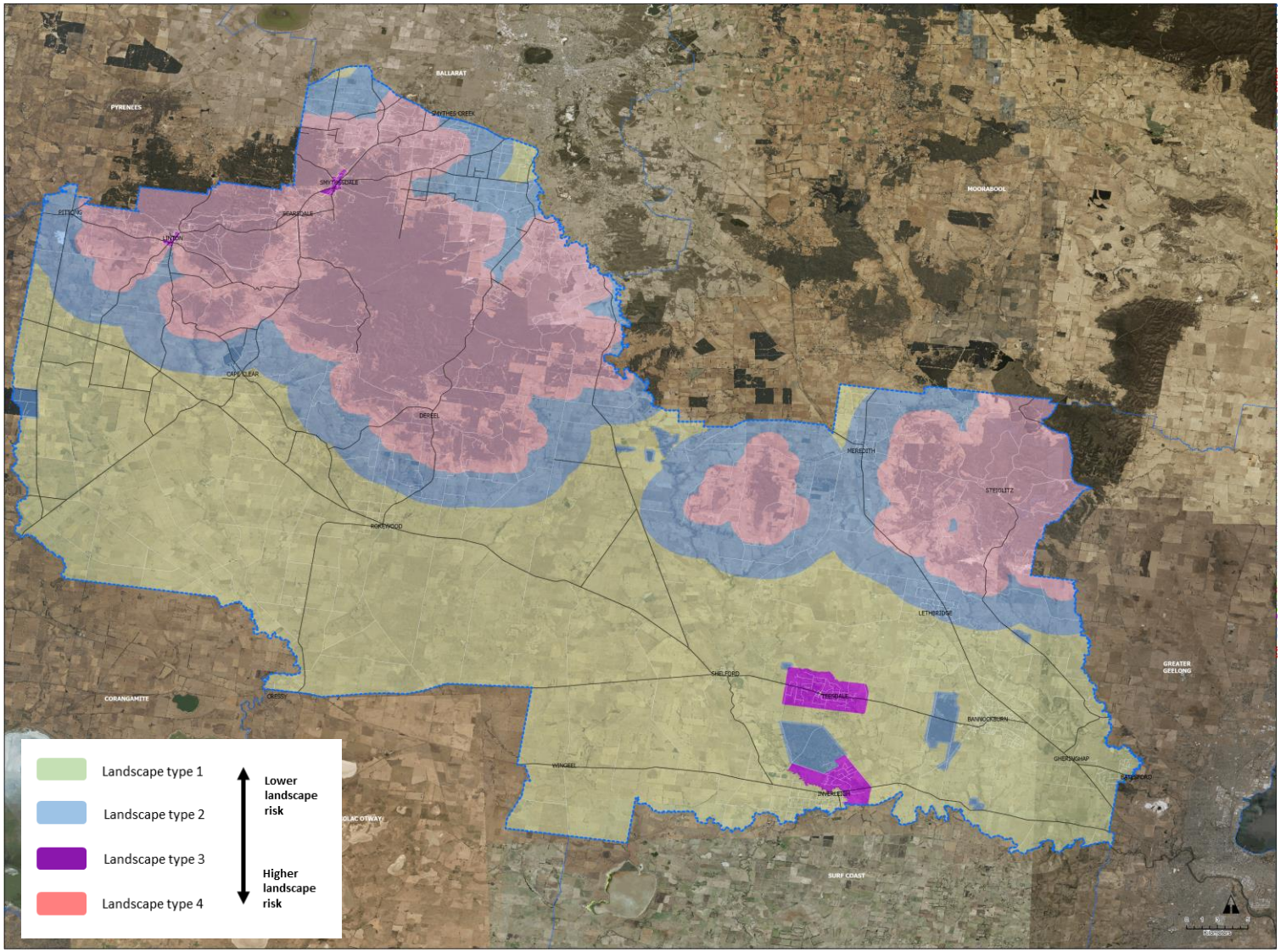
Recommendation 3: Locations not suitable for development

New planning scheme proposals directing development to Landscape type 4 locations should be avoided.

Recommendation 4: Future strategic and settlement planning

The information from this strategic bushfire assessment be available to be considered as part of the development of the Shire-wide settlement plan for Golden Plains Shire.

FIGURE 9: LANDSCAPE TYPE LOCATIONS



Main study area & Golden Plans Shire

Road

Landscape type 1

Landscape type 2

Landscape type 3

Landscape type 4

Boundaries shown on this plan are schematic only and should not be scaled to property boundaries

References

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

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Golden Plains Planning Scheme

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