

Kevin Hazell

BUSHFIRE PLANNING

Settlement-scale bushfire assessments for selected places in Golden Plains Shire

Final Report

19 October 2022
Version 1.0

Prepared for:

Golden Plains Shire Council
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Bannockburn VIC 3331

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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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v0.1	7 October 2022	Draft for Council review	Kevin Hazell Town Planner
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1. Introduction

Kevin Hazell Bushfire Planning has been engaged by Golden Plains Shire Council (the 'Council') to prepare settlement level bushfire assessments for a selection of settlements in Golden Plains Shire. This is part of the Councils housing & growth strategic planning work being undertaken on a Shire-wide basis.

The settlement level bushfire assessments on this report build on strategic and landscape bushfire assessments included in the *Golden Plains Shire Strategic Bushfire Assessment* (2022), which should be read alongside this document.

The settlements considered in this report include:

- Lethbridge
- Inverleigh
- Teasdale
- Meredith
- Napoleans
- Haddon
- South east boundary with Western Geelong Growth Area

See **Figure 1A: Settlements assessed in this report**

The purpose of the assessments in this report are to consider settlement-level policies in *c13.02-1S Bushfire Planning* of the planning scheme. These include the following.

c13.02-1S Bushfire Planning requires a location in easy reach that provides 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.*

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 above policies, along with those considered in the *Golden Plains Shire Strategic Bushfire Assessment* (2022), support conclusions being reached on optimised locations for growth from a bushfire perspective, according to the following *c13.02-1S Bushfire Planning* policies:

- *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.*

Methodology for this report

This report uses landscape types included in the *Golden Plains Shire Strategic Bushfire Assessment* (2022) and extends these through an analysis at the settlement and local level.

Recommendations in this report only have regard to bushfire considerations. The Council will use these recommendations alongside other considerations in determining where growth will occur. A recommendation in this report for growth does not preclude the necessity for non-bushfire factors to be applied and which may, ultimately, make a recommendation in this report neither feasible or deliverable.

About Landscape types and how bushfire affects settlements

Landscape types have been identified in *Golden Plains Shire Strategic Bushfire Assessment* (2022) . They are an important strategic layer to define the risk to a location and the relative risk between locations to inform strategic planning decisions. An overview of Landscape types is included below.

A generalised understanding of how bushfire threatens settlements is contained in DELWP (2020) guidance, an overview of which is included below.

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

See **Figure 1C: Generalised understanding of how bushfire threatens settlements (DELWP 2020)**

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 settlement strategy for Golden Plains Shire and planning scheme changes arising from it. This report does not consider bushfire factors for applications under current planning scheme policies or settings and should not be used for this purpose unless and until any recommended requirements are introduced into the planning scheme.

FIGURE 1A: SETTLEMENTS ASSESSED IN THIS REPORT

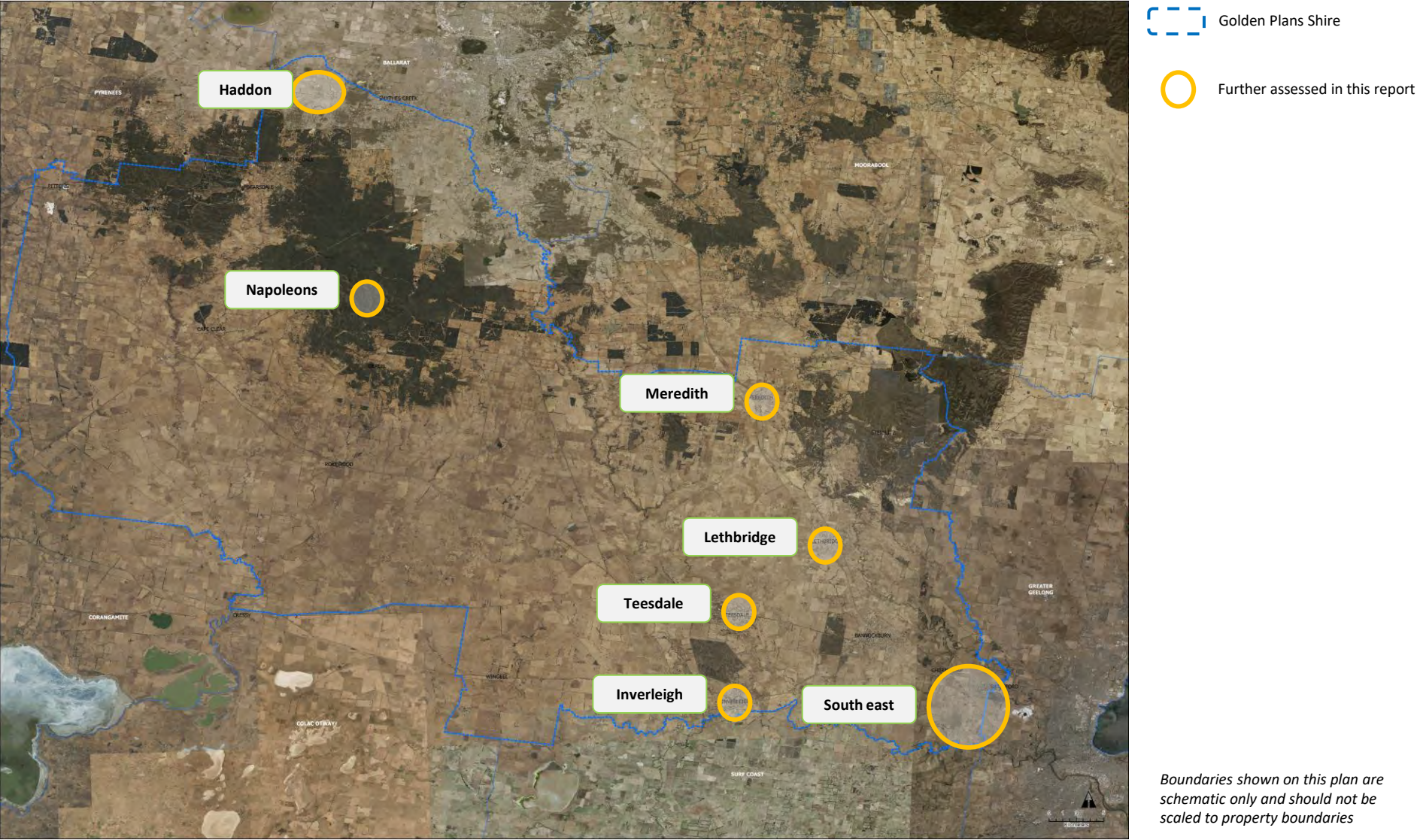


FIGURE 1B: OVERVIEW OF LANDSCAPE TYPES

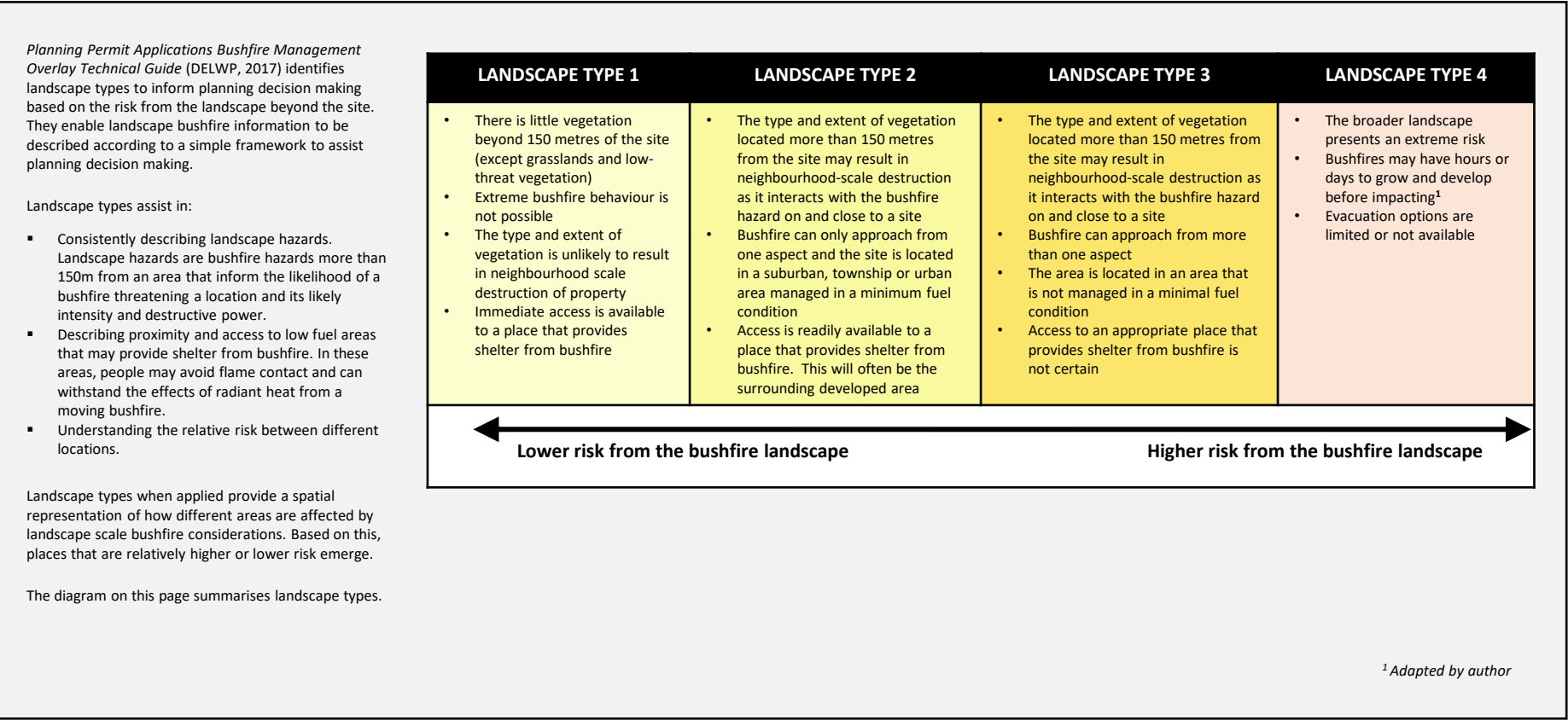


FIGURE 1C: GENERALISED UNDERSTANDING OF HOW BUSHFIRE THREATENS SETTLEMENTS (DELWP 2020)

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.

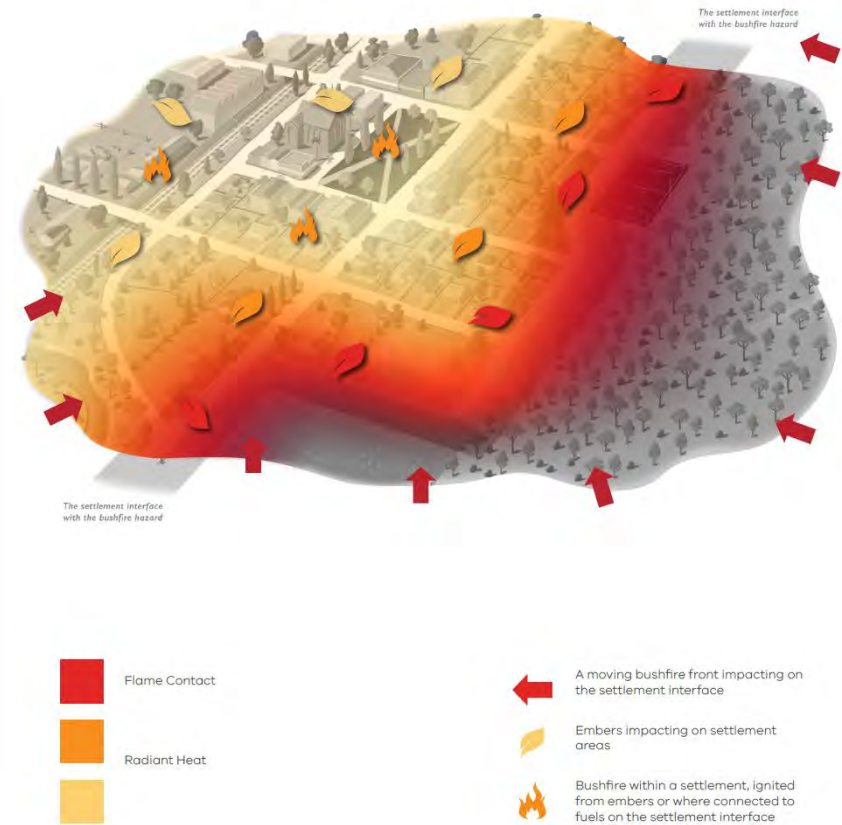
3. Bushfire 'fuels' in vegetated areas

'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.



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:

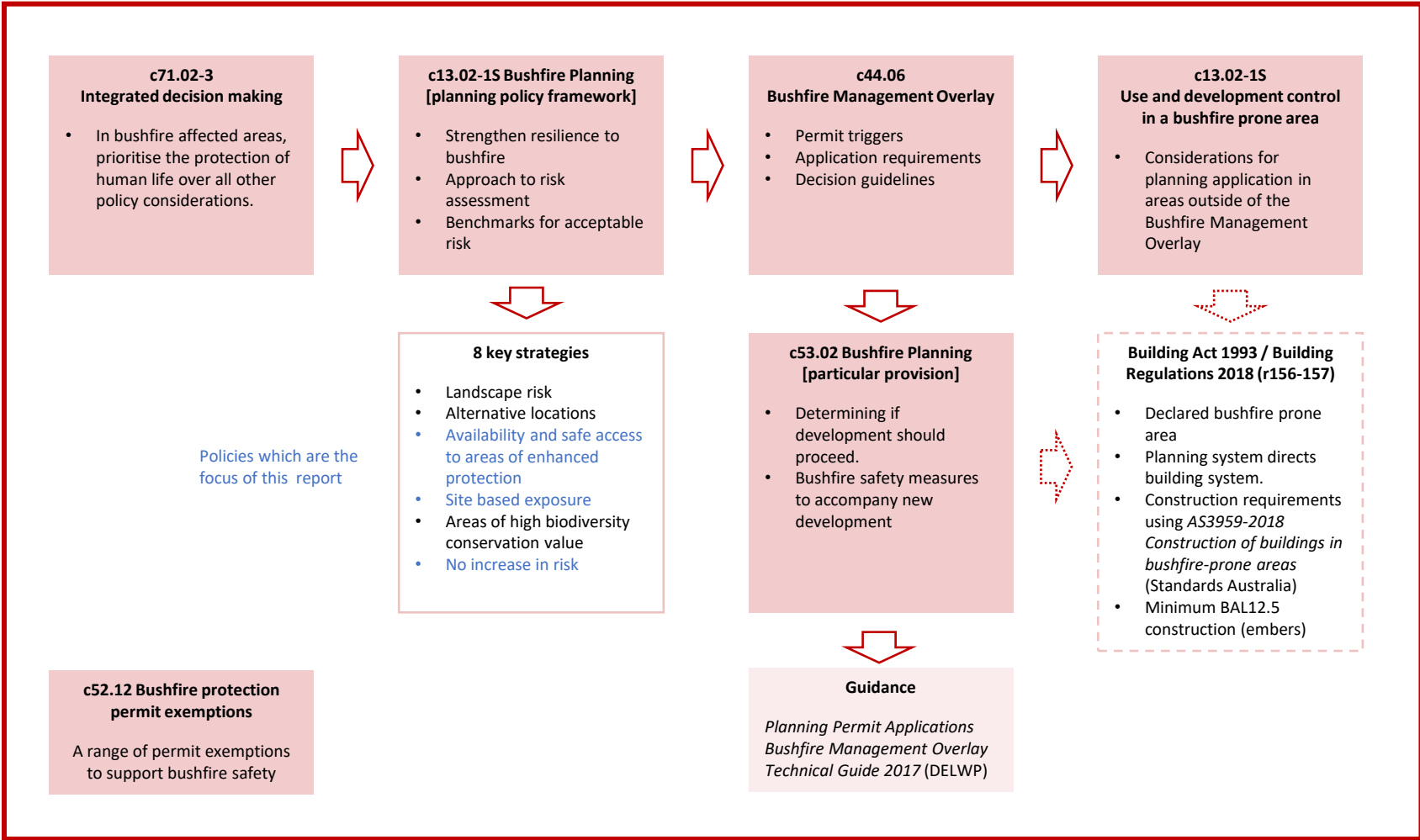
- *Consider the risk of bushfire to people, property and community infrastructure.*
- *Require the implementation of appropriate bushfire protection measures to address the identified bushfire risk.*
- *Ensure new development can implement bushfire protection measures without unacceptable biodiversity 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 defensible 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 defensible space for a dwelling under the Bushfire Management Overlay, where the defensible 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 defensible 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. Lethbridge

Lethbridge is located in the south-eastern part of the Shire within a grassland setting.

3.1 Golden Plains Shire Strategic Bushfire Assessment

The *Golden Plains Shire Strategic Bushfire Assessment* (2022) assessed Lethbridge as Landscape type 1 and 2. This positions the settlement at the lower end of bushfire risk, reflecting its grassland setting.

The slightly elevated risk associated with the identified Landscape type 2 reflected the forested areas orientated on Steiglitz, where there is potential for increased ember ignited grassfires and multiple grassfires as bushfire moves out of the forest. The separation of Lethbridge from the forest areas (more than 2km) and them being orientated on a north / north-east aspect did not warrant any further elevated Landscape type being assessed, with Landscape type 2 providing the necessary caution.

On the basis of Landscape type 1 and 2, the *Golden Plains Shire Strategic Bushfire Assessment* (April 2022) concluded that Lethbridge is a lower landscape risk location.

See **Figure 3A: Location within Golden Plains Shire and landscape type**

3.2 Contextual information

The following contextual information is relevant:

- The existing settlement primarily comprises land in the Township Zone and the Low Density Residential Zone.
- The Bushfire Management Overlay does not affect the settlement or land immediately adjoining the settlement.
- The entire settlement is within the Bushfire Prone Area.

See **Figure 3B: Contextual information**

3.3 Availability of safe areas at the settlement scale

c13.02-1S Bushfire Planning requires a location in easy reach that provides 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 are available in Lethbridge, orientated on the Lethbridge Recreation Reserve and urban development to its north and west. These areas are located central to the settlement and provide a basis for people to move from the settlement edges into a place of low fuel. The journey becomes less credible the further away settlement areas are from the low fuel areas, although currently this is to 1km which remains relatively good.

The access to safer places is marginally more difficult as a result of the north-south railway line / reservation, limiting access from the west to the larger low fuel areas oriented around Lethbridge Recreation Reserve. However, an area of low fuel is identified to the west of the railway line also, meaning the railway line is less significant as a constraint.

There may be other low fuel areas, but the lack of a defined settlement edge means there is some potential for a moving grassfire to penetrate deep into the settlement, especially in the larger Low Density Residential Zone areas and in vacant sites within the Township Zone.

See **Figure 3C for areas assessed as low-fuel and areas capable of being assessed as BAL:Low (DG – add this figure reference to all chapters**

3.4 Site based exposure at the settlement scale

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).*

Grassland is the assessed hazard. It arises on all sides of the settlement and in many parts within the settlement owing to the larger lot sizes, the vacant sites, and where there is no clear settlement / hazard edge. The slope is mostly flat throughout the settlement and its surrounds.

Based on grassland, setbacks of 19m are generally required from bushfire hazards to achieve a radiant heat flux of less than 12.5kw/sq.m in completed development. This is highly achievable in new development. A site assessment as part of new development should be prepared to confirm site based exposure requirements are met.

3.5 Discussion

Lethbridge is optimised at the Shire-wide and strategic level as a location to direct growth, consistent with Landscape type 1 and 2 being assessed.

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.*

To give effect to these policies, planning for Lethbridge needs to address the main bushfire which is the lack of defined settlement / hazard edges and the increasingly longer journeys to low fuel areas as the settlement moves outwards, especially from the Low Density Residential Zone land and beyond.

Planning should promote the consolidation of vacant sites in all parts of the settlement. These vacant sites if developed would remove most if not all grassland hazards, benefiting the settlement overall.

Settlement growth oriented to the south-west and west of the existing Township Zone would maximise bushfire safety by providing good access to existing low fuel areas. The opportunity to provide perimeter roads on the (new) permanent settlement edge and applying bushfire vegetation management requirements would strengthen the resilience of the settlement overall to a south-western grassfire.

Development to the east and north is constrained by the existing Low Density Residential Zone areas, which are not low fuel, and the longer journeys through bushfire hazards to access low fuel areas in the core of the settlement if development proceeded. Land to the north is also marginally higher risk arising from the potential for increased grassfires from the forested areas to the north (around Steiglitz).

In the grassland setting of Lethbridge, the risk difference is more nuanced as at some level the hazard is all grassland, irrespective of location. However, on balance land to the south and west of the settlement is much better optimised for growth especially from an access to low fuel areas perspective and would be relatively and absolutely lower risk than development being directed to the north and east.

3.6 Recommendations

1. Existing land zoned for residential uses be developed and consolidated to reduce hazards within settlement areas.
2. Direct development to the south and west of existing residential zoned land.
3. Structure planning should define a permanent settlement edge from which bushfire management can be planned. Once defined, the settlement edge should be optimised for bushfire by:
 - Requiring a perimeter road on the planned settlement / hazard interface separating development from grassland hazards. Where lots are fragmented, structure planning and a suitable planning scheme control should coordinate development on multiple sites to deliver perimeter roads.
 - Applying bushfire vegetation requirements to all land within 50m of settlement edges as part of planning applications and rezoning of land.
4. Apply bushfire vegetation management to lots larger than 1,250sq.m.

FIGURE 3A: LANDSCAPE TYPE LOCATIONS AS ASSESSED IN THE GOLDEN PLAINS SHIRE STRATEGIC BUSHFIRE ASSESSMENT

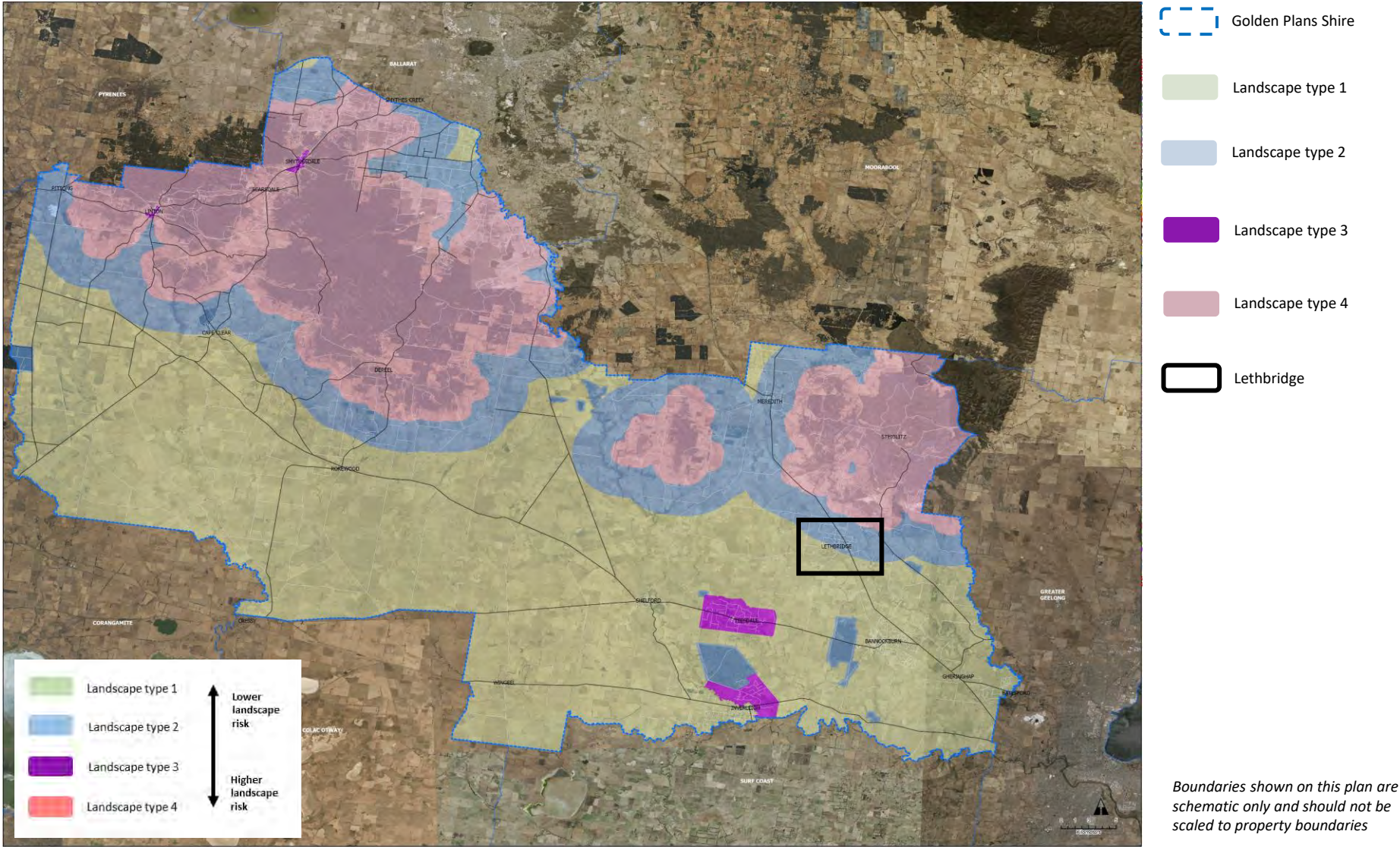
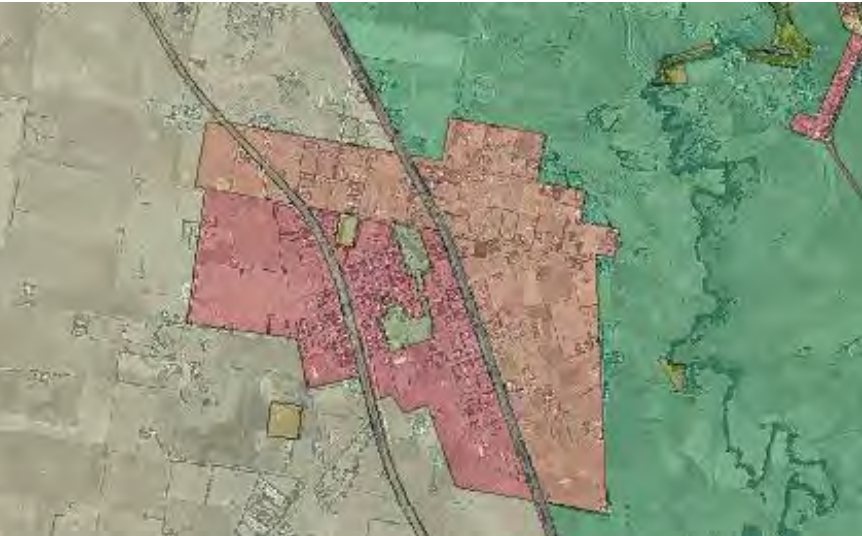


FIGURE 3B: CONTEXTUAL INFORMATION

Zones



Bushfire Management Overlay



Bushfire Prone Area



Slope based on 10m contour



FIGURE 3C: LETHBRIDGE SETTLEMENT SCALE ASSESSMENTS AND RECOMMENDATIONS



4. Inverleigh

Inverleigh is located in the southern part of the Shire.

4.1 Golden Plains Shire Strategic Bushfire Assessment

The *Golden Plains Shire Strategic Bushfire Assessment* (2022) assessed Inverleigh (south) as Landscape type 1, positioning this area at the lowest end of landscape risk. This reflects the proximity to low fuel areas and the lack of non-grassland hazards.

Inverleigh (north) was assessed as Landscape type 3, reflecting the risk arising from the Inverleigh Flora Reserve and the lack of low fuel areas. This positions the area in a location with an elevated landscape bushfire risk.

See **Figure 4A: Location within Golden Plains Shire and landscape type**

4.2 Contextual information

The following contextual information is relevant:

- The existing settlement primarily comprises land in the Township Zone south / south-west of the Leigh River / Barwon River and the Low Density Residential Zone to the north and east of the Leigh River / Barwon River.
- The Bushfire Management Overlay applies to the Inverleigh Flora Reserve and land within 150m of the reserve.
- An area of land orientated around the town centre in Inverleigh is not within a Bushfire Prone Area. All other land is within the Bushfire Prone Area.

See **Figure 4B: Contextual information**

The Council has advised that there are flooding issues in Inverleigh which this report has not had regard to. Management of flood hazards need to be read alongside this report.

4.3 Availability of safe areas at the settlement scale

c13.02-1S Bushfire Planning requires a location in easy reach that provides 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 are available in the Township Zone part of the settlement. Here also are low fuel areas arising from the smaller lot sizes, generally forming a corridor from the Inverleigh Recreation Reserve to the River Leigh and Barwon River. These areas are located central to the settlement and provide a basis for people to move from the settlement edges into a place of low fuel.

There is no BAL:Low areas in the Low Density Residential Zone parts of the settlement and no areas that can be reliably assessed as low fuel. Access to safer places is relatively good immediately adjoining the bridge but becomes progressively poorer as it requires travel on a circuitous access route, with some development having a journey of more than 2km. Access is further complicated by access being via a single bridge.

4.4 Site based exposure at the settlement scale

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 slope is mostly flat throughout the settlement and its surrounds.

Forest or woodland is likely to be the assessed hazard in the Inverleigh Flora Reserve. Setbacks of up to 33m (woodland) or 48m (forest) are generally required from bushfire hazards to achieve a radiant heat flux of less than 12.5kw/sq.m in completed development. This is achievable in new development owing to the larger lot sizes around the Inverleigh Flora Reserve. Where land is already zoned, smaller setbacks may be permitted.

Grassland is the dominant hazard on all other sides of the settlement. Based on grassland, setbacks of 19m are generally required from bushfire hazards to achieve a radiant heat flux of less than 12.5kw/sq.m in completed development. This is highly achievable in new development.

Elevated fuels arise in the low density part of Inverleigh, north of the Leigh River. Vegetation is not capable of being assessed as low threat (or low fuel) throughout low density lots, so they are considered to be a bushfire hazard. The dominant hazards would be grassland and modified vegetation.

A site assessment as part of new development should be prepared to confirm site based exposure requirements are met.

4.5 Discussion – Inverleigh (South)

Inverleigh (south) is optimised at the Shire-wide and strategic level as a location to direct growth, consistent with Landscape type 1 and 2 being assessed.

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.*

Settlement growth oriented to the north, south and west of the existing Township Zone would maximise bushfire safety by providing good access to existing low fuel areas. Due to the dense road network, there is plenty of scope to move away from hazard edges deeper into low fuel areas and places of enhanced safety. The opportunity to provide perimeter roads any new permanent settlement edge is available. Applying bushfire vegetation management requirements to the (new) permanent settlement edge would provide for an effective settlement / bushfire interface.

4.6 Discussion – Inverleigh (North)

Inverleigh (North) is not as well optimised at the Shire-wide and strategic level as a location to direct growth, consistent with Landscape type 3 being assessed. It adjoins a larger area of hazard in the Inverleigh Flora Reserve and lacks low fuel areas. The existing Low Density Residential Zone areas contain hazards amongst development. There is no defined hazard edge and bushfire is to be expected in all parts of the existing settlement.

The Golden Plains Shire Strategic Bushfire Assessment (2022) included the following commentary:

Despite the higher fuels in and around Inverleigh (north) [...], 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 deficiencies 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) [...] to be assessed as Landscape type 2.

Planning scheme directions that seek to direct growth to Inverleigh (north) [...] 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.

The above commentary is confirmed in this settlement level analysis.

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.*

Based on this, there is opportunity to create a lower risk outcome in Inverleigh (North) which would manage the risk to new areas to achieve a Landscape type 1 or 2 outcome whilst also reduce the risk to existing Low Density Residential Zone land.

This can be achieved by directing development to areas away from the Inverleigh Flora Reserve and which are also closer to the existing low fuel areas in Inverleigh (South). These areas would need to be carefully planned to be entirely low fuel, preventing the retention or introduction of hazardous vegetation as has arisen in other parts of Inverleigh (North).

A number of enquiries, including the 2009 Victorian Bushfires Royal Commission and a more recent Auditor General report, identified low rates of compliance with bushfire-related planning permit conditions. This arises from a lack of landowner compliance and responsible authority compliance checks and enforcement activities.

At this time, there would be a low level of confidence planning permit conditions alone would deliver a reliably low fuel area in conjunction with new development in Inverleigh (North). Limited reliance could also be placed on fire prevention planning, given the eviprogessive introduction of hazards in Low Density Residential Zone land in Inverleigh.

Given the criticality of creating this safer place in proximity to new development, which is essential to satisfy bushfire policy, as well as the opportunity to deliver an overall risk reduction for existing development, it is considered that the low fuel area should be given the weight of a neighbourhood safer place. These are planned and delivered by Councils under the Country Fire Authority Act 1953, with the Country Fire Authority providing a quality assurance role. The management of the areas are more reliably afforded Council prioritisation and typically arising as part of public land (for example, on public open space).

Where a low fuel area was enabled through the mechanism of a neighbourhood safer place supported by planning requirements for low fuel outcomes on private land, it would be reasonable to conclude that even in the context of larger lots, a low fuel area would be available in Inverleigh (North), a Landscape type 1 or 2 outcome would arise, and development could be directed to these areas.

Land to the north-west of existing Low Density Residential Zone land, adjoining the Inverleigh Flora Reserve, is not considered suitable for directing growth as they are constrained by the existing Low Density Residential Zone areas, which are not low fuel, and the longer journeys through bushfire hazards to access possible new and existing low fuel areas.

4.7 Recommendations

1. Existing land zoned for residential uses for developed and consolidated to reduce hazards within settlement areas.
2. Structure planning should define a permanent settlement edge from which bushfire management can be planned. Once defined, the settlement edge should be optimised for bushfire by:
 - Requiring a perimeter road on the planned settlement / hazard interface separating development from grassland hazards. Where lots are fragmented, structure planning and a suitable planning scheme control should coordinate development on multiple sites to deliver perimeter roads.
 - Applying bushfire vegetation requirements to all land within 50m of settlement edges as part of planning applications and rezoning of land.
3. Apply bushfire vegetation management to lots larger than 1,250sq.m.
4. Designating a neighbourhood safer place in Inverleigh (North) in conjunction with new development. Development should be staged to not permit new residents until the neighbourhood safer place is operational.

FIGURE 4A: LANDSCAPE TYPE LOCATIONS AS ASSESSED IN THE GOLDEN PLAINS SHIRE STRATEGIC BUSHFIRE ASSESSMENT

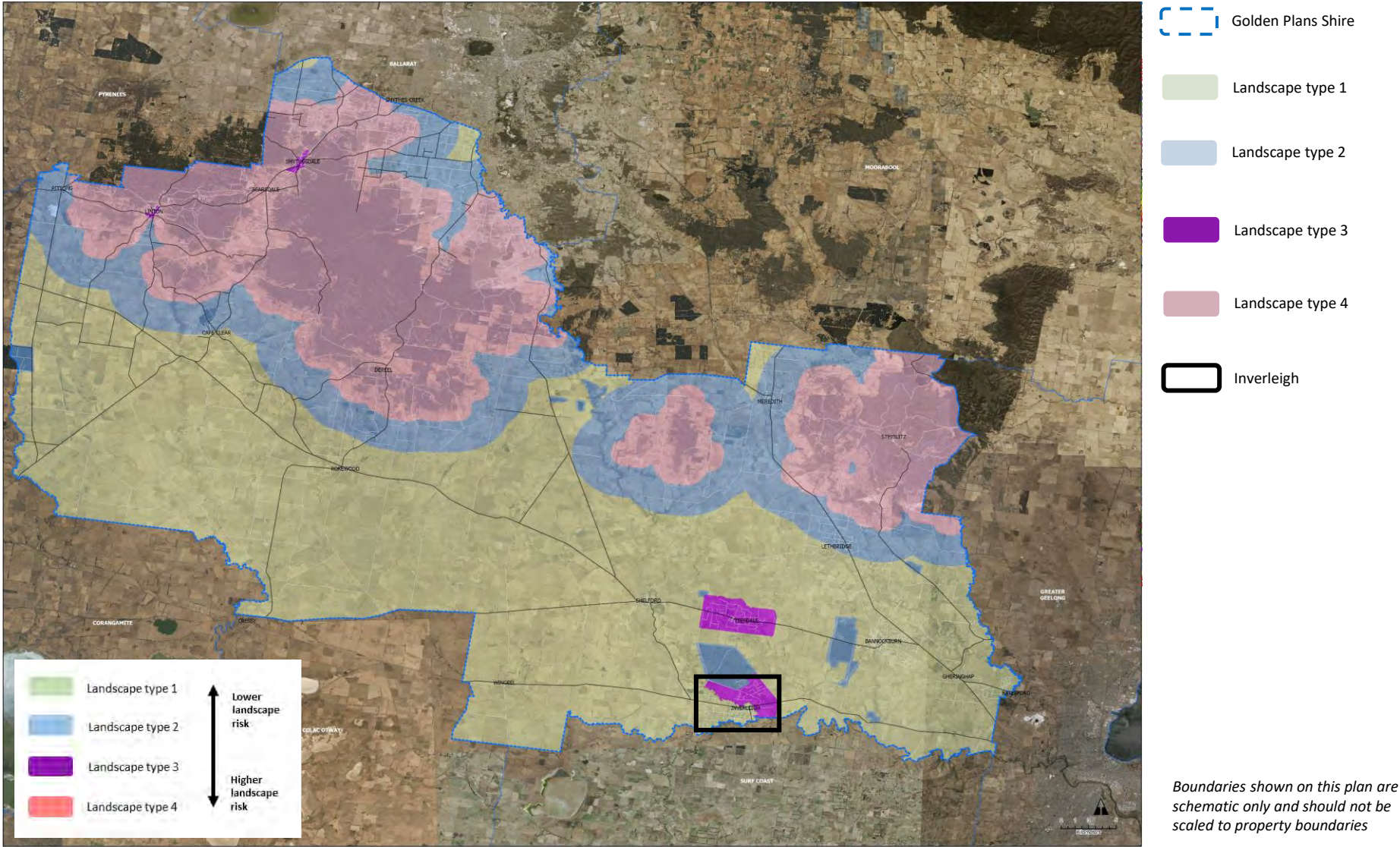


FIGURE 4B: CONTEXTUAL INFORMATION

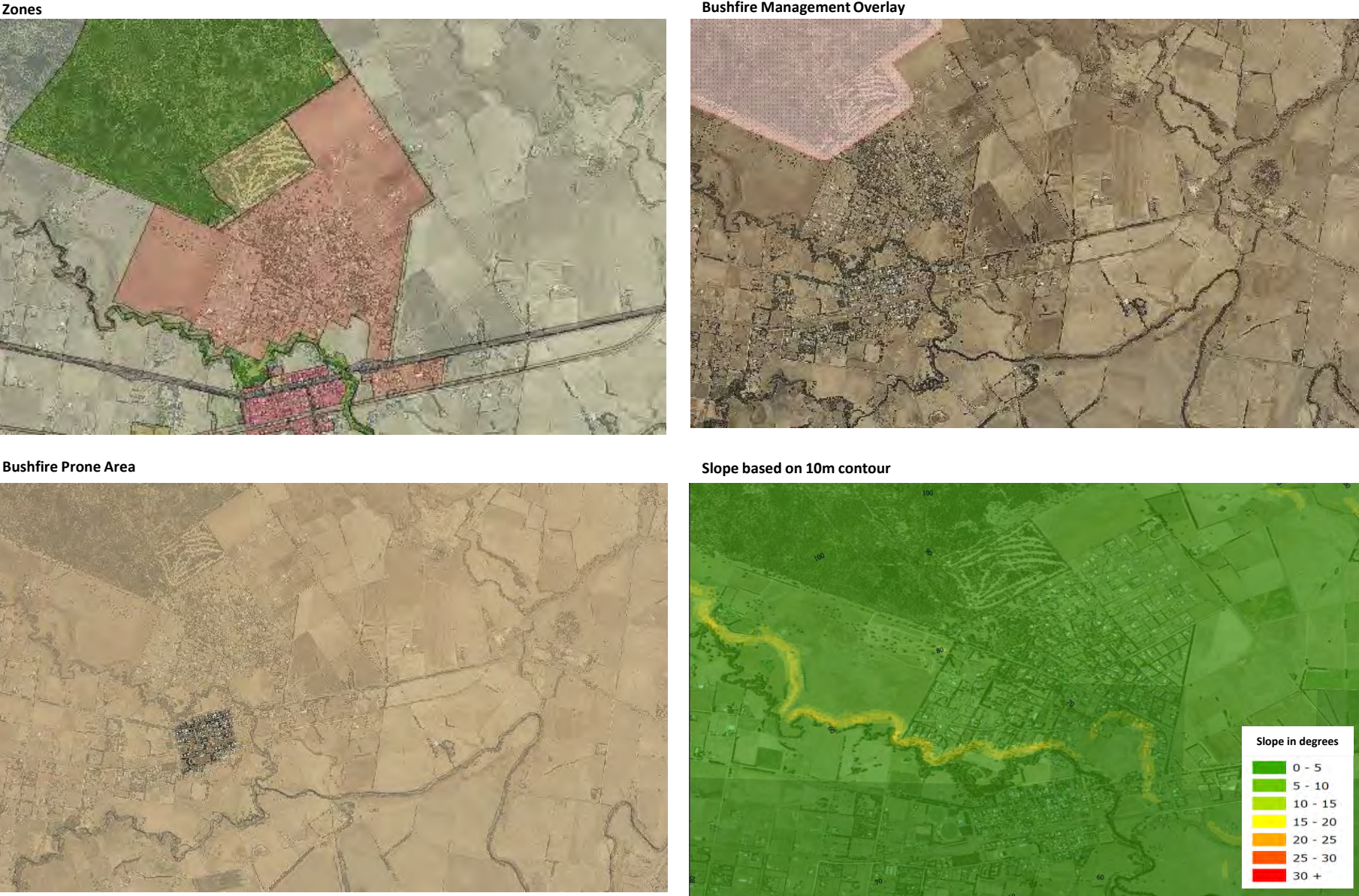
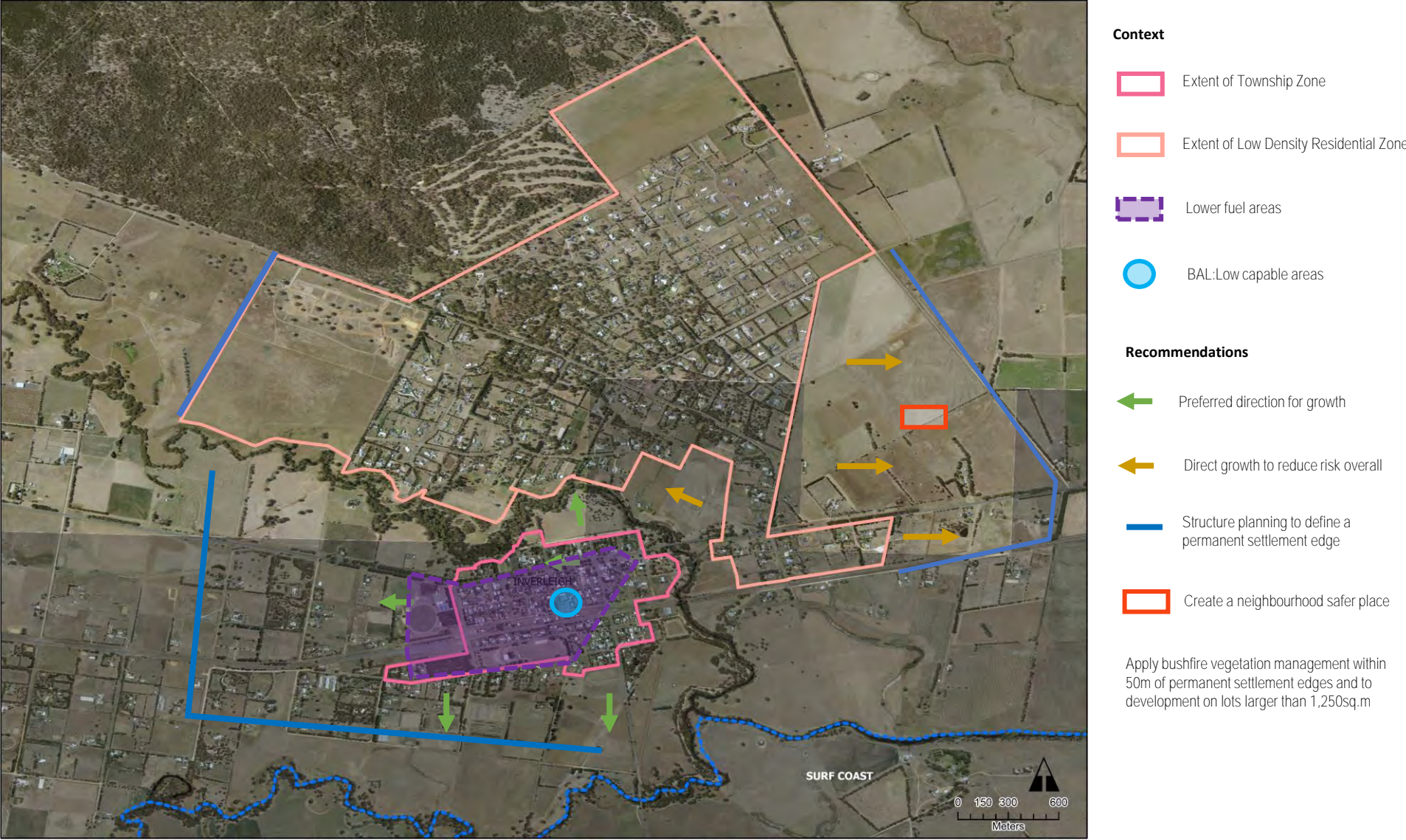


FIGURE 4C: INVERLEIGH SETTLEMENT SCALE ASSESSMENTS AND RECOMMENDATIONS



5. Teesdale

Teesdale is located in the southern part of the Shire.

5.1 Golden Plains Shire Strategic Bushfire Assessment

The *Golden Plains Shire Strategic Bushfire Assessment* (2022) assessed Teesdale as Landscape type 3. This positions Teasdale as having elements of a higher risk settlement.

See **Figure 5A: Location within Golden Plan Shire and landscape type**

5.2 Contextual information

The following contextual information is relevant:

- The existing settlement primarily comprises land in the Low Density Residential Zone but also has a small are of Township Zone in the central part of the settlement.
- The Bushfire Management Overlay applies to the hazard in Don Wallace Reserve and land within 150m of the hazard in this reserve. Another area of Bushfire Management Overlay applies to a small patch of hazard to the north-west of the settlement.
- The entire settlement is within the Bushfire Prone Area.
- The slope of land is mostly flat.

See **Figure 5B: Contextual information**

5.3 Availability of safe areas at the settlement scale

c13.02-1S Bushfire Planning requires a location in easy reach that provides 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.*

There are no reliably assessed areas of BAL:Low. Lower fuel areas arise depending on the management of individual lots and the extent of vegetation they contain. But the lack of a defined settlement edge means there is not a high level of spatial specificity that can be applied to where low fuel area are, although the land within the Township Zone would at a neighbourhood level be the lowest fuel areas. The lack of low fuel areas was the key driver of the assessed Landscape type 3 in Teesdale.

5.4 Site based exposure at the settlement scale

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 slope is mostly flat throughout the settlement and its surrounds.

Grassland is the assessed hazard. It arises on all sides of the settlement and in many parts within the settlement where residential land is not low fuel. Based on grassland, setbacks of 19m are generally required from bushfire hazards to achieve a radiant heat flux of less than 12.5kw/sq.m in completed development. This is highly achievable in new development.

Elevated fuels arise in many parts of the low density areas of Teesdale. Vegetation is not capable of being assessed as low threat (or low fuel) throughout low density lots, so they are a bushfire hazard. The dominant hazards would be modified vegetation. At the site scale, some of these areas may contain excludable vegetation (for example, strips of trees or trees with minimal understory and ground level vegetation). But this vegetation is not consistent enough to map as a low fuel precinct in this report.

Woodland hazards are assessed to the south of Teesdale, west of Native Hut Creek. Setbacks of up to 33m (woodland) are generally required to achieve a radiant heat flux of less than 12.5kw/sq.m in completed development.

A site assessment as part of new development should be prepared to confirm site based exposure requirements are met.

5.5 Discussion

Teesdale is not initially optimised at the Shire-wide and strategic level as a location to direct growth, consistent with Landscape type 3 being assessed. It contains no area of BAL:Low and no area that can be reliably assessed as low-fuel. Passive shelter option and the potential to move away from settlement edges to places of enhanced safety are limited.

The *Golden Plains Shire Strategic Bushfire Assessment* (2022) included the following commentary:

Despite the higher fuels in and around [...] 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 [...] Teesdale to be assessed as Landscape type 2.

Planning scheme directions that seek to direct growth to [...] 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.

The above commentary is confirmed in this settlement level analysis.

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.*

The lack of landscape-scale (non-grassland) hazards is a favourable attribute of Teesdale, and where new development is low fuel and delivers an area of BAL:Low, the development would be capable of being assessed as a Landscape type 1 outcome. Through planning decision making, the deficiencies in Teesdale can be overcome in completed development, making new development acceptable and reducing risk to existing areas which do not currently have access to low fuel areas.

This can be achieved by requiring new development to be entirely low fuel, preventing the retention or introduction of hazardous vegetation, creating a low-fuel neighbourhood, and delivering an area of BAL:Low. This development could be directed to the west or east of the existing settlement, initially avoiding extending the settlement closer to the Inverleigh Flora Reserve or into the area of woodland to the south of the settlement.

Native Hut Creek appears to create a barrier to development to the north of Teesdale, and this area has not been assessed.

To part of the southern aspect of Teesdale, an area of woodland exist. To satisfy the need to create a low fuel outcome in new development, the woodland would need to be modified so it not a hazard. This in effect involves removing the woodland although some individual trees could remain. The merits of this has not been assessed in this report, but it is considered in the context of other options being available, development would not be directed here for vegetation protection purposes in any event.

Other land to the south of the settlement that avoids the woodland area would direct development in close proximity to the Inverleigh Flora Reserve. Whilst higher risk, where development was set back at least 500m, it would be acceptable based on reducing the risk overall by providing a new southern settlement edge on the aspect with the Inverleigh Flora Reserve and significant improving on existing conditions.

5.6 Recommendations

1. Development can be directed to the east and west of the existing settlement which are lower risk locations.
2. Development can be directed to the south of the existing settlement, avoiding the woodland area, where it would reduce risk overall by providing an effective hazard interface and significantly improving on the exiting southern settlement edge.
3. Structure planning should define a permanent settlement edge from which bushfire management can be planned. Once defined, the settlement edge should be optimised for bushfire by:
 - Requiring a perimeter road on the planned settlement / hazard interface separating development from grassland hazards. Where lots are fragmented, structure planning and a suitable planning scheme control should coordinate development on multiple sites to deliver perimeter roads.
 - Applying bushfire vegetation requirements to all land within new development areas to create areas of BAL:Low and low fuel. These will also be beneficial for existing development within walking distance of new development sites, enhancing the resilience of the settlement overall.
4. Apply bushfire vegetation management to lots larger than 1,250sq.m.

FIGURE 5A: LANDSCAPE TYPE LOCATIONS AS ASSESSED IN THE GOLDEN PLAINS SHIRE STRATEGIC BUSHFIRE ASSESSMENT

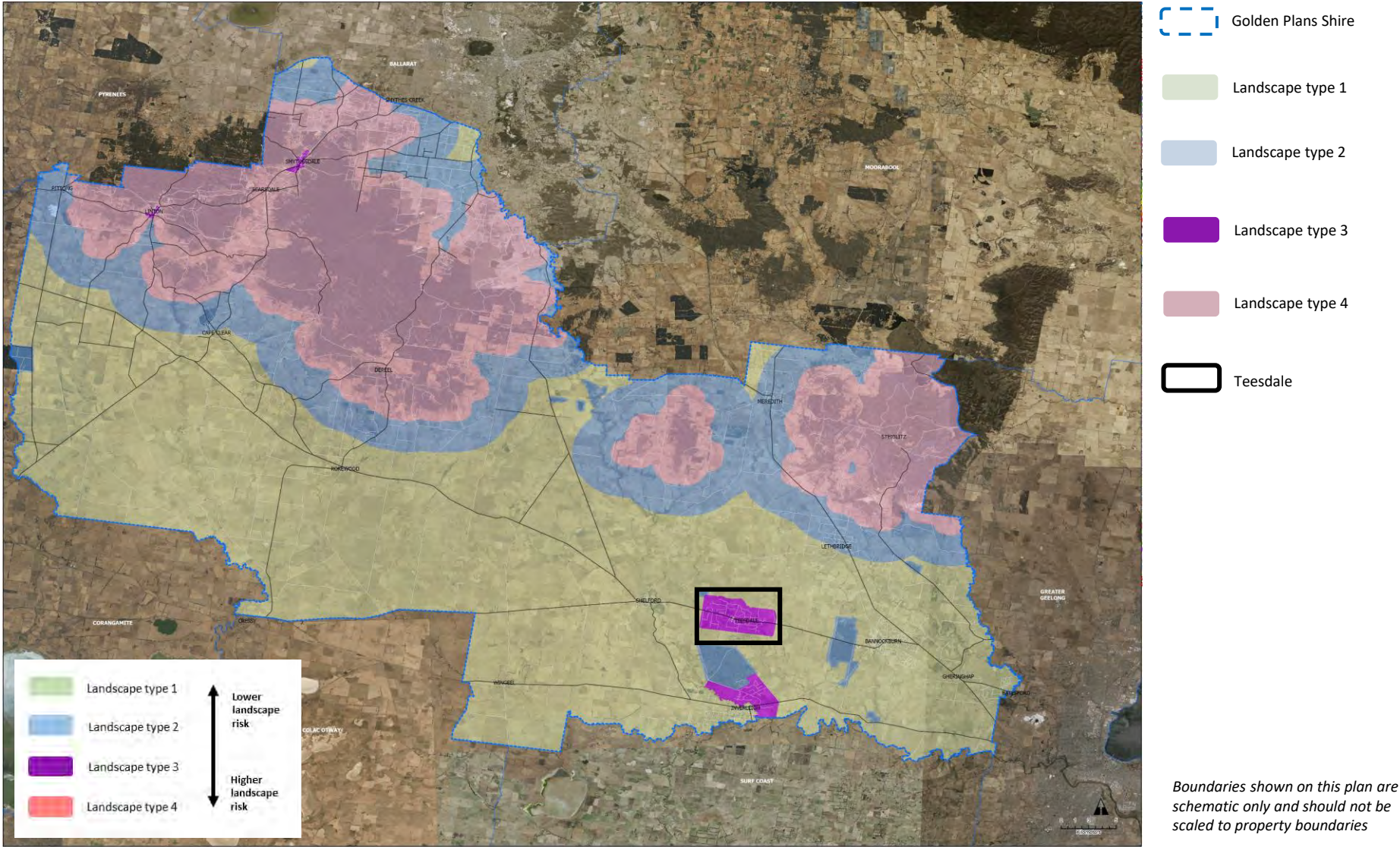
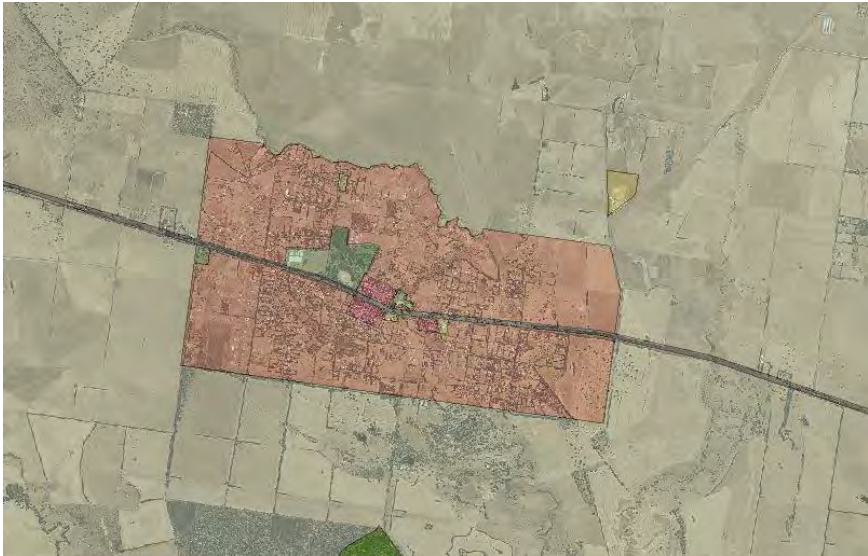


FIGURE 5B: CONTEXTUAL INFORMATION

Zones



Bushfire Prone Area



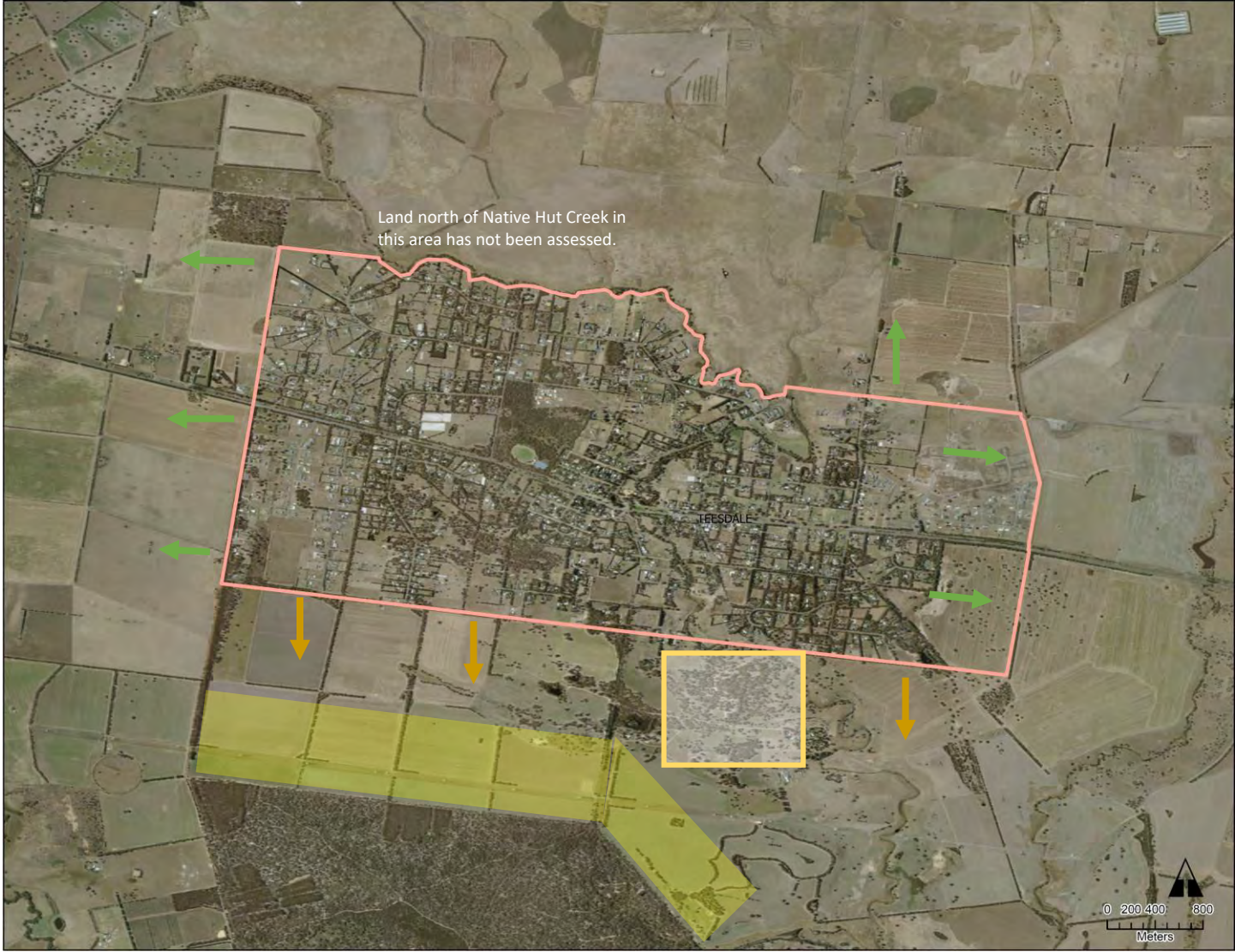
Bushfire Management Overlay



Slope based on 10m contour



FIGURE 5C: TEESDALE SETTLEMENT SCALE ASSESSMENTS AND RECOMMENDATIONS



Context

 Extent of Low Density Residential Zone

Note: There are no areas of BAL:Low assessed

Recommendations

 Preferred direction for growth

 Direct growth to reduce risk overall

 Avoid development in woodland areas

 Avoid development within 500m of Inverleigh Flora Reserve

Structure planning to define a permanent settlement edge

Apply bushfire vegetation management within 50m of permanent settlement edges and to development on lots larger than 1,250sq.m

Develop vacant sites to remove hazards

6. Meredith

Meredith is located in the eastern part of the Shire.

6.1 Golden Plains Shire Strategic Bushfire Assessment

The *Golden Plains Shire Strategic Bushfire Assessment* (2022) assessed Meredith as Landscape type 2. This positions the settlement at the lower end of bushfire risk. Landscape type 2 arose rather than Landscape type 1 because of the settlement's proximity to larger forested areas in the much wider landscape.

See Figure 6A: Location within Golden Plan Shire and landscape type

6.2 Contextual information

The following contextual information is relevant:

- The existing settlement primarily comprises land in the Township Zone in the central part of the settlement and land to the north and east in a Low Density Residential Zone.
- The Bushfire Management Overlay does not apply to the settlement or land adjoining the settlement.
- The entire settlement is within the Bushfire Prone Area.
- The slope of land is mostly flat.

See Figure 6B: Contextual information

6.3 Availability of safe areas at the settlement scale

c13.02-1S Bushfire Planning requires a location in easy reach that provides 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 are available in Meredith, orientated around the Midland Highway where it passes the town centre. These areas are located central to the settlement and provide a basis for people to move from the settlement edges into a place of low fuel. The journey becomes less credible the further away settlement areas are from the low fuel areas, although currently this is to 1km which remains relatively good.

There may be other low fuel areas, but the lack of a defined settlement edge means there is some potential for a moving grassfire to penetrate into the settlement, especially in the larger Low Density Residential Zone areas and in vacant sites within the Township Zone.

6.4 Site based exposure at the settlement scale

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 slope is mostly flat throughout the settlement and its surrounds.

Grassland is the assessed hazard. It arises on all sides of the settlement and in many parts within the settlement owing to areas of larger lot sizes, vacant sites, and where there is no clear settlement / hazard edge.

Based on grassland, setbacks of 19m are generally required from bushfire hazards to achieve a radiant heat flux of less than 12.5kw/sq.m in completed development. This is highly achievable in new development. A site assessment as part of new development should be prepared to confirm site based exposure requirements are met.

6.5 Discussion

Meredith is optimised at the Shire-wide and strategic level as a location to direct growth, consistent with Landscape type 2 being assessed.

c13.02-15 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.*

To give effect to these policies, planning for Meredith needs to address the main bushfire constraints in Meredith which is the lack of defined settlement / hazard edges and the increasingly longer journeys to low fuel area as the settlement moves outwards, especially if for land beyond the Low Density Residential Zone.

Planning should promote the consolidation of vacant sites in all parts of the settlement. These vacant sites if developed would remove most if not all grassland hazards, benefiting the settlement overall.

Settlement growth oriented to the west and south, immediately adjoining the existing Township Zone, would maximise bushfire safety by providing good access to existing low fuel areas. The opportunity to provide perimeter roads on the (new) permanent settlement edge and applying bushfire vegetation management requirements would strengthen the resilience of the settlement overall to a grassfire approaching from the west.

Development to the east and north is constrained by the existing Low Density Residential Zone areas, which are not low fuel, and the longer journeys through bushfire hazards to access low fuel areas in the core of the settlement. However, to the north modest extension of the town would still enable good access to low fuel areas in the centre of the settlement.

6.6 Recommendations

1. Existing land zoned for residential uses be developed and consolidated to reduce hazards within settlement areas.
2. Direct development to the west, north and south of existing residential zoned land.
3. Structure planning should define a permanent settlement edge from which bushfire management can be planned. Once defined, the settlement edge should be optimised for bushfire by:
 - Requiring a perimeter road on the planned settlement / hazard interface separating development from grassland hazards. Where lots are fragmented, structure planning and a suitable planning scheme control should coordinate development on multiple sites to deliver perimeter roads.
 - Applying bushfire vegetation requirements to all land within 50m of settlement edges as part of planning applications and rezoning of land.
4. Apply bushfire vegetation management to lots larger than 1,250sq.m.

FIGURE 6A: LANDSCAPE TYPE LOCATIONS AS ASSESSED IN THE GOLDEN PLAINS SHIRE STRATEGIC BUSHFIRE ASSESSMENT

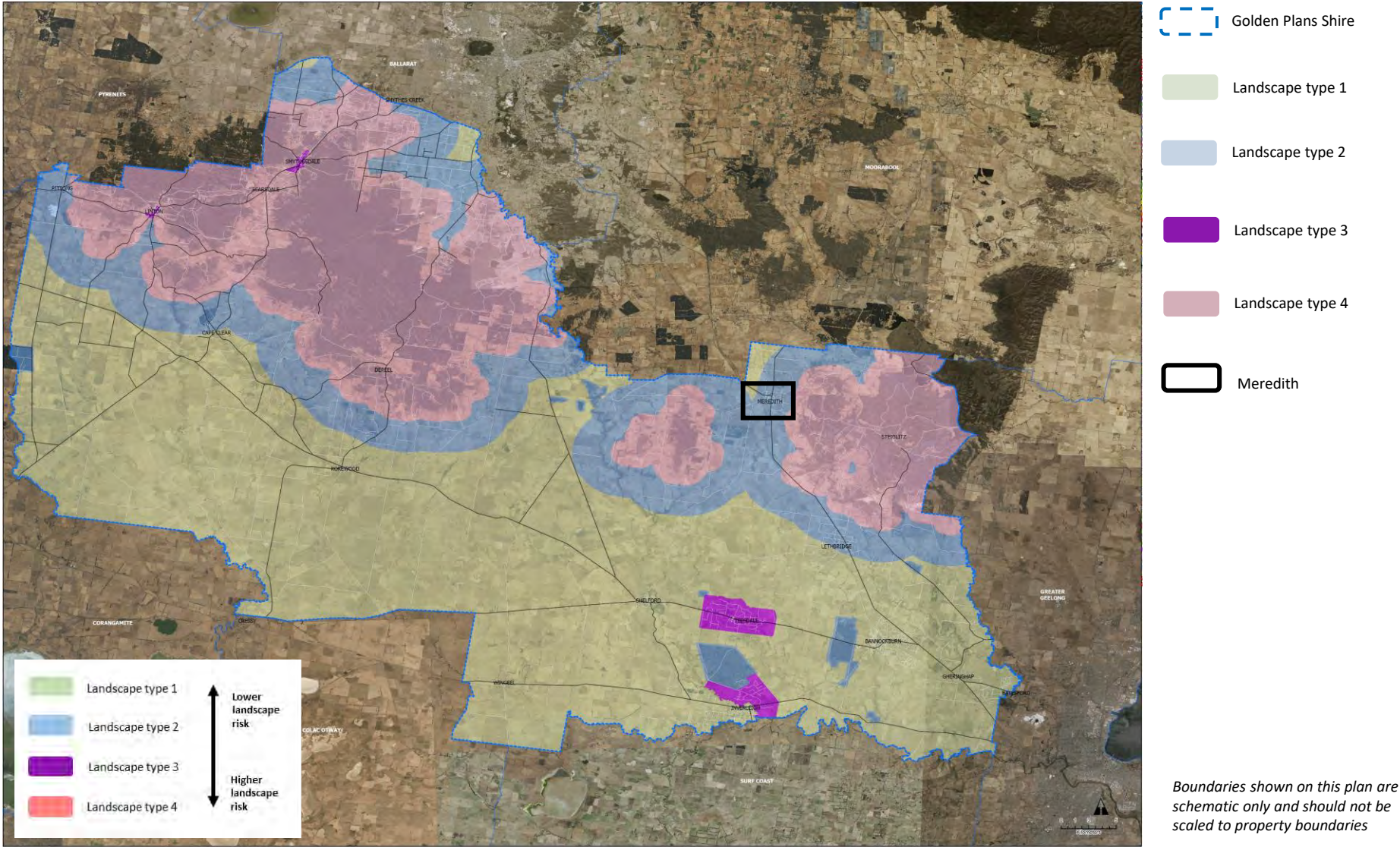


FIGURE 6B: CONTEXTUAL INFORMATION

Zones



Bushfire Prone Area

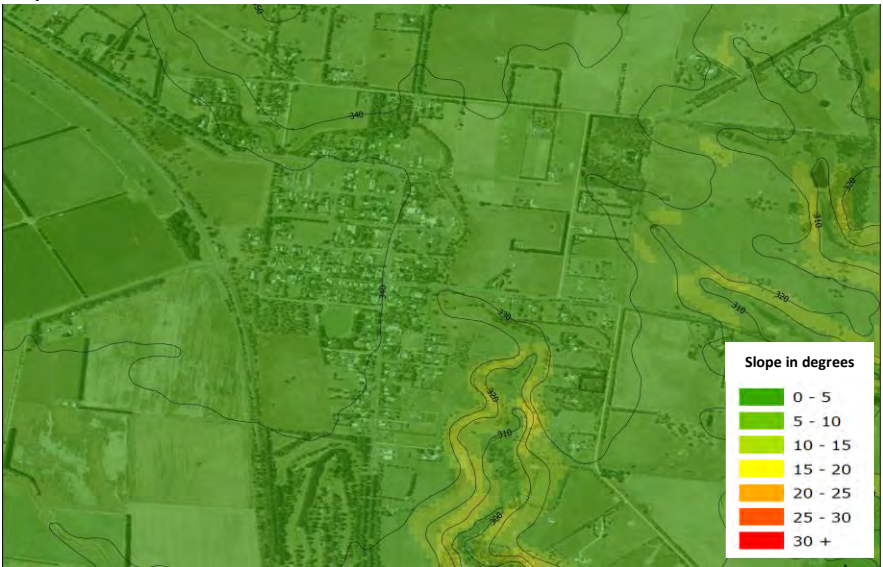


Entire map area is within the Bushfire Prone Area

Bushfire Management Overlay



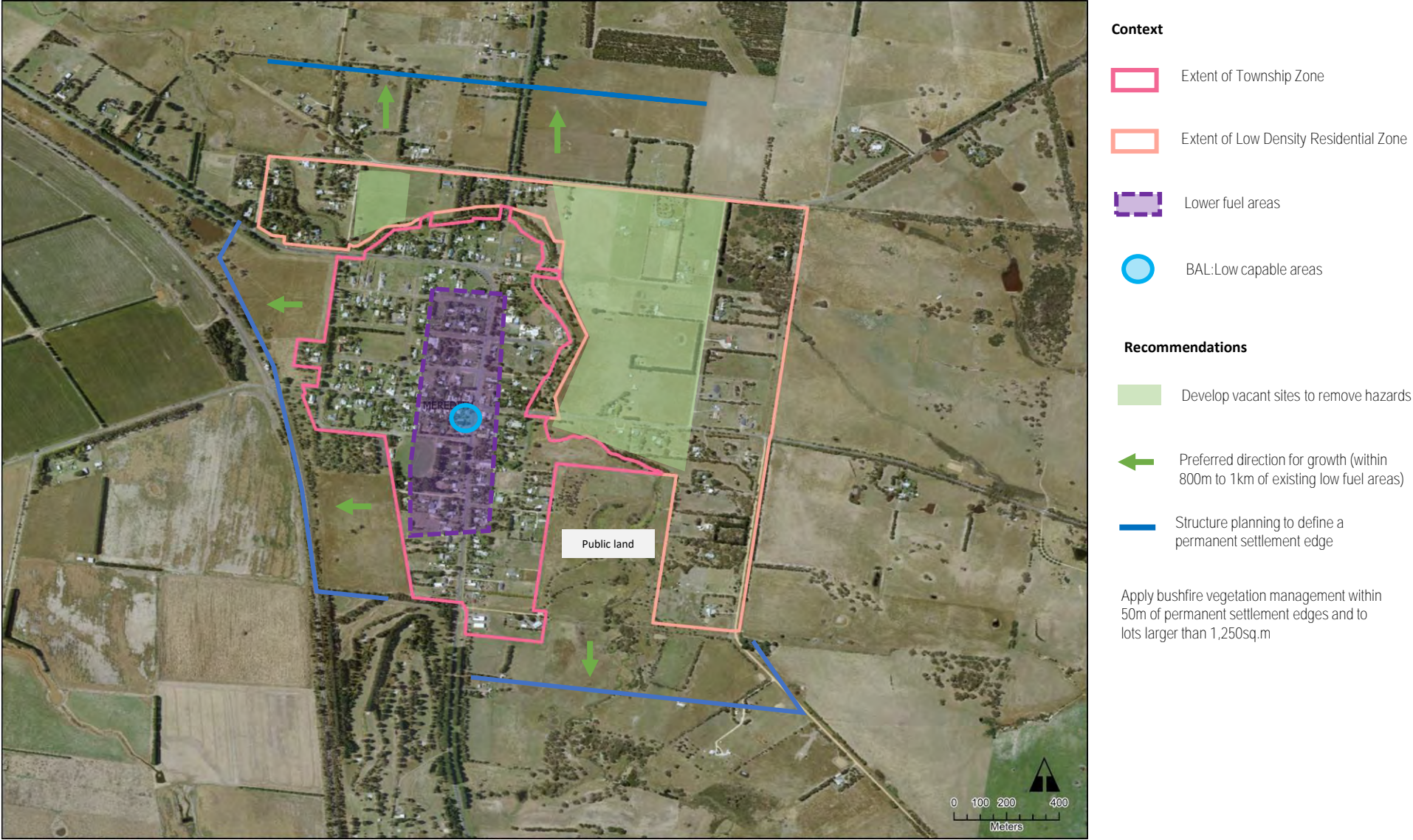
Slope based on 10m contour



Slope in degrees

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

FIGURE 6C: MEREDITH SETTLEMENT SCALE ASSESSMENTS AND RECOMMENDATIONS



7. Napoleons

Napoleons is located in the eastern part of the Shire.

7.1 Golden Plains Shire Strategic Bushfire Assessment

The *Golden Plains Shire Strategic Bushfire Assessment* (2022) assessed Napoleons as partly Landscape type 2 and partly Landscape Type 3. The elevated landscape risk arises from its location in a wider area where forest fires may arise and where there is potential for increased ember ignited grassfires and multiple grassfires as bushfire moves out of the forest. The separation of Napoleons from the forest areas to the west is more than 2km, meaning there is a good level of separation provided, but the lack of low fuel areas given the narrow strip of existing development warranted a higher landscape risk triggering the necessary caution in taking forward settlement planning.

See **Figure 7A: Location within Golden Plan Shire and landscape type**

7.2 Contextual information

The following contextual information is relevant:

- The existing settlement primarily comprises land in the Township Zone in the central part of the settlement and land to the north and east in a Low Density Residential Zone.
- The Bushfire Management Overlay applies to non-grasslands hazards to the immediate east of the settlement.
- All of the settlement and adjoining land is within the Bushfire Prone Area.
- The slope of land is mostly flat.

See **Figure 7B: Contextual information**

7.3 Availability of safe areas at the settlement scale

c13.02-1S Bushfire Planning requires a location in easy reach that provides 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 are not reliably available in Napoleons. The Napoleons Recreation Reserve has adequate dimensions where it would be an area of BAL:Low (more than 50m from grassland hazards), but there is no guarantee it would be managed in this way at all times.

Due the linear configuration of existing development, low fuel areas do not reliably arise due to the lack of a defined settlement edge, meaning there is some potential for a moving grassfire to penetrate into the settlement, especially in the larger Low Density Residential Zone areas and in vacant sites within the Township Zone.

7.4 Site based exposure at the settlement scale

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 slope is mostly flat throughout the settlement and its surrounds.

Grassland is the assessed hazard. It arises on all sides of the settlement and in many parts within the settlement owing to areas of larger lot sizes, vacant sites, and where there is no clear settlement / hazard edge. The slope is mostly flat throughout the settlement and its surrounds.

Based on grassland, setbacks of 19m are generally required from bushfire hazards to achieve a radiant heat flux of less than 12.5kw/sq.m in completed development. This is highly achievable in new development. A site assessment as part of new development should be prepared to confirm site based exposure requirements are met.

7.5 Discussion

Napoleons is not well optimised at the Shire-wide and strategic level as a location to direct growth, consistent with Landscape type 2 & 3 being assessed.

c13.02-15 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.*

The lack of existing low fuel land and BAL:Low areas means new development cannot readily be justified. In contrast, the development and consolidation of existing land zoned for residential purposes, of which there is much available land, would themselves deliver lower fuel areas and over time an area of BAL:Low. This would be highly favourably and does not require a planning scheme change to achieve this outcome.

Additional outward growth is not necessary in an environment where existing land remains undeveloped and in a context where more grassfires are likely to arise due the proximity to large, forested areas to the west and from where extreme fire behaviour is to be expected.

There is no overall risk reduction argument that could be made, as the risk reduction can be delivered by existing land zoned for residential uses being developed.

7.6 Recommendations

1. Existing land zoned for residential uses be developed and consolidated to reduce hazards within existing settlement areas.
2. Applying bushfire vegetation requirements to all land within 50m of settlement edges as part of planning applications and to lots larger than 1,250sq.m.
3. Structure planning should use the existing Zoned land edge and require a perimeter road on the planned settlement / hazard interface separating development from grassland hazards. Where lots are fragmented, structure planning and a suitable planning scheme control should coordinate development on multiple sites to deliver perimeter roads.

FIGURE 7A: LANDSCAPE TYPE LOCATIONS AS ASSESSED IN THE GOLDEN PLAINS SHIRE STRATEGIC BUSHFIRE ASSESSMENT

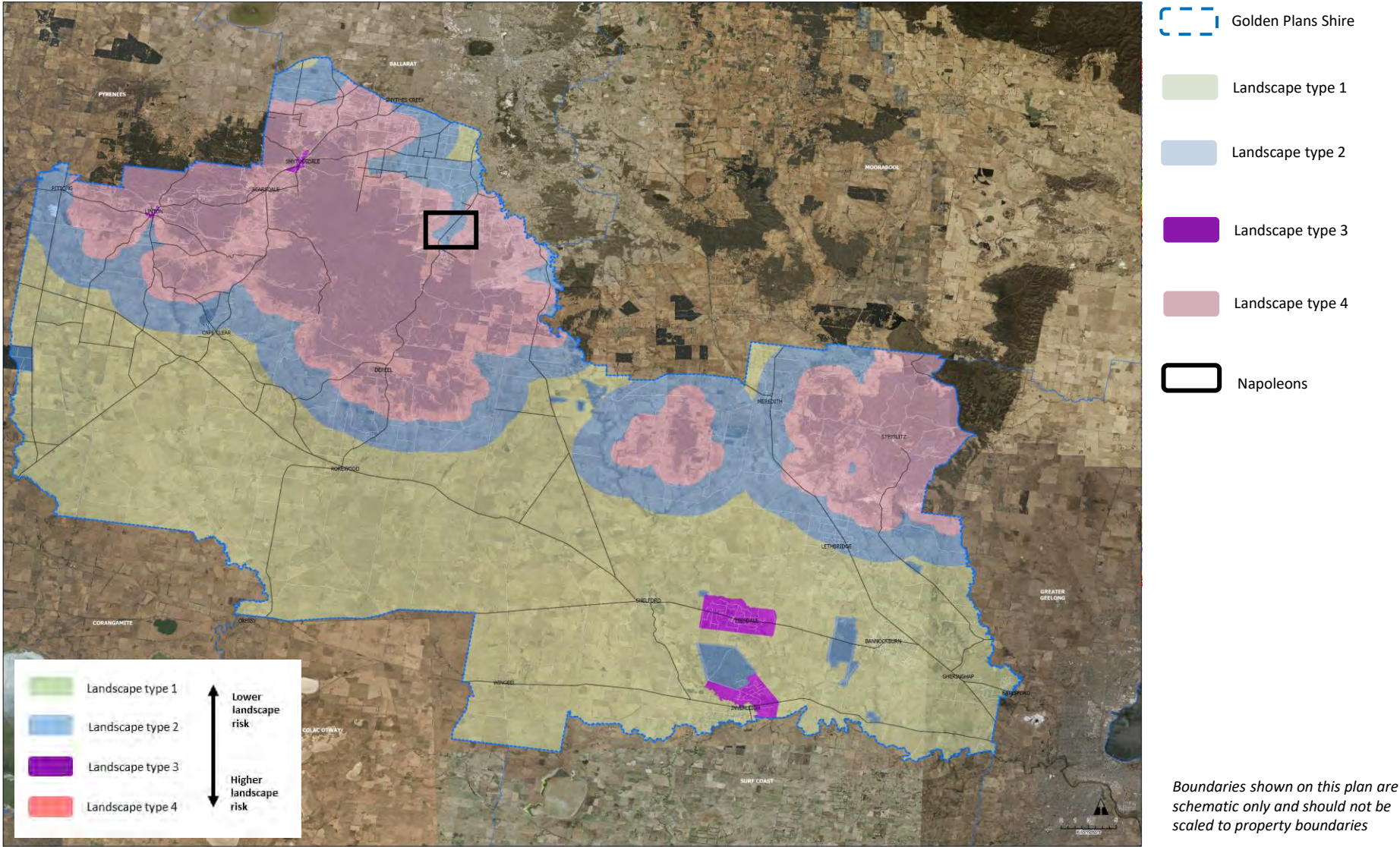
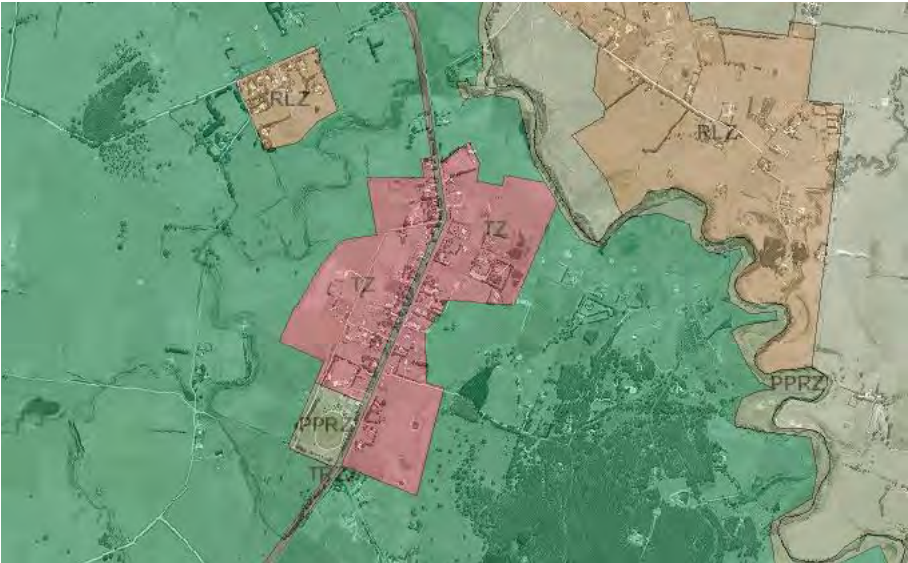


FIGURE 7B: CONTEXTUAL INFORMATION

Zones



Bushfire Management Overlay



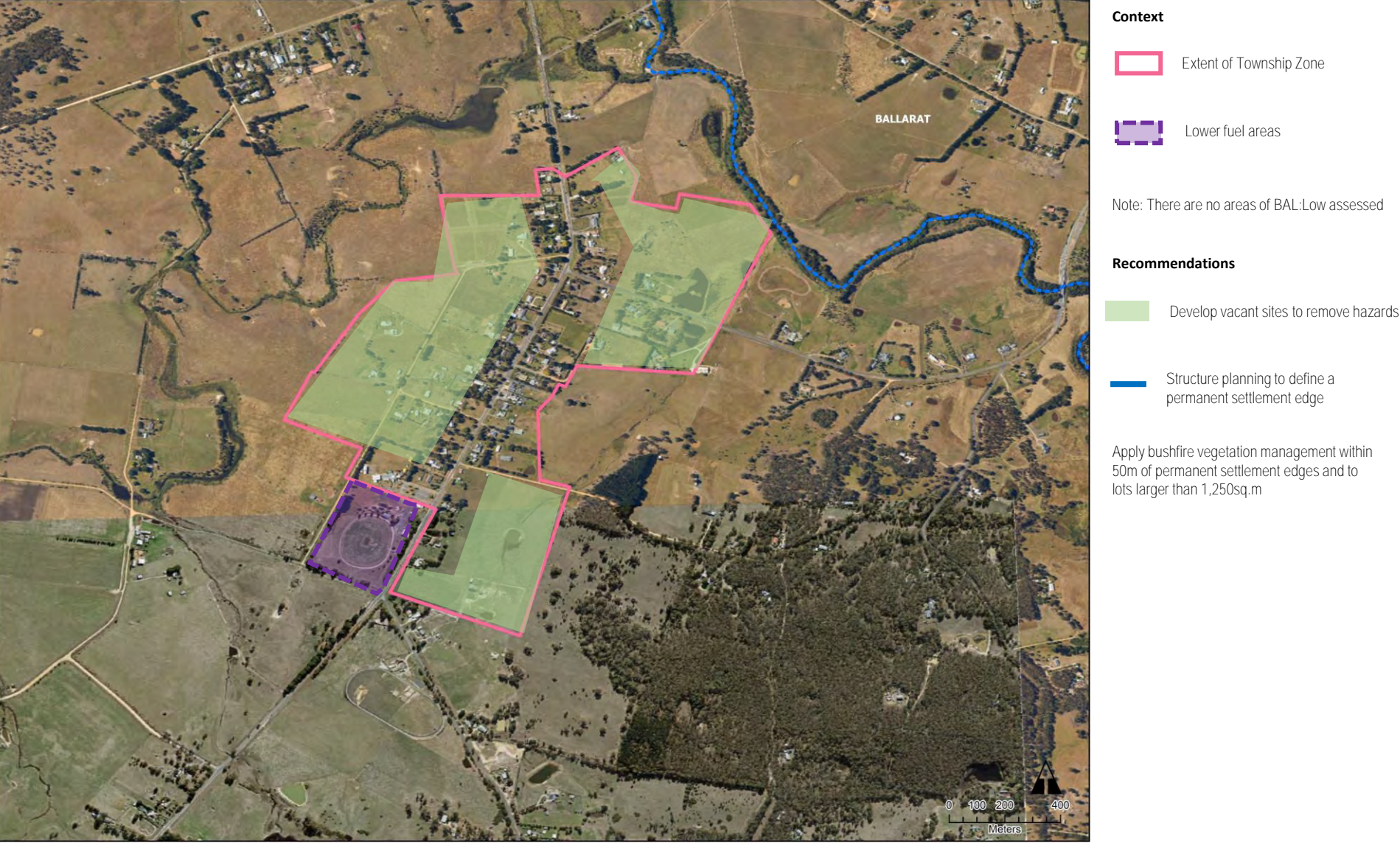
Bushfire Prone Area



Slope based on 10m contour



FIGURE 7C: NAPOLEONS SETTLEMENT SCALE ASSESSMENTS AND RECOMMENDATIONS



8. South-east Shire boundary with Western Geelong growth area

The south-east Shire boundary with the Western Geelong Growth Area is generally defined as land between the settlement of Batesford and the southern Shire boundary.

8.1 Golden Plains Shire Strategic Bushfire Assessment

The *Golden Plains Shire Strategic Bushfire Assessment* (2022) assessed the south-east Shire boundary as Landscape type 1, positioning the area at the lowest end of bushfire risk reflecting its grassland setting.

See **Figure 8A: Location within Golden Plan Shire and landscape type**

8.2 Contextual information

The following contextual information is relevant:

- The existing area comprises land in the Farming Zone.
- The Bushfire Management Overlay applies to a small area of non-grasslands hazards in the north-east corner of the area.
- The slope of land is mostly flat.

See **Figure 8B: Contextual information**

8.3 Availability of safe areas at the settlement scale

c13.02-1S Bushfire Planning requires a location in easy reach that provides 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.*

There are not currently low fuel or BAL:Low areas, including in Batesford.

The anticipated typology of development would be a growth area, building on the Western Geelong growth area to the immediate east. In this context, and in the Landscape type 1 setting, new development would create an area of BAL:Low and large, neighbourhood scale areas of low fuel land will be established. There is no barrier to these being achieved and they would be required, in any even, as a result of any growth-area enabling rezoning.

8.4 Site based exposure at the settlement scale

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 slope is mostly flat throughout the area.

Grassland is the assessed hazard. It arises on all sides of the area. Based on grassland, setbacks of 19m are generally required from bushfire hazards to achieve a radiant heat flux of less than 12.5kw/sq.m in completed development. This is highly achievable in new development. A site assessment as part of new development should be prepared to confirm site based exposure requirements are met.

The area of land to the north-east, within the Dog Rocks Reserve, would be assessed as forest or woodland. Setbacks of up to 33m (woodland) or 48m (forest) are generally required from bushfire hazards to achieve a radiant heat flux of less than 12.5kw/sq.m in completed development. This is achievable in new development owing to the availability of land within any growth area setting.

8.5 Discussion

Land adjoining the south east Shire boundary is optimised at the Shire-wide and strategic level as a location to direct growth, consistent with Landscape type 1 being assessed and consistent with growth areas across Victoria.

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.*

These policies can be given effect to through growth area structure planning, as it common in growth areas (for example, Bannockburn, Geelong, Melbourne). The requirements that arise for defined settlement edges, low fuel development and the ability to walk back 2-3 street to places of absolute safety can be achieved.

The balance of decision making mostly relates to staging and ensuring favourable features are available for the first residents. However, over time and as new development arises, large neighbourhoods of bushfire optimised development can arise.

8.6 Recommendations

1. Development can be directed to the south-east Shire boundary in a growth area context.
2. Growth area planning / structure planning should define a permanent settlement edge from which bushfire management can be planned. Once defined, the settlement edge should be optimised for bushfire by:
 - Requiring a perimeter road on the planned
 - Applying bushfire vegetation requirements to all land within 50m of settlement edges as part of the rezoning of land.
3. Growth area planning can accommodate the usual range of bushfire requirements relating to bushfire, consistent with growth area planning across Victoria.
4. Apply bushfire vegetation management to lots larger than 1,250sq.m, if these were to be proposed.

FIGURE 8A: LANDSCAPE TYPE LOCATIONS AS ASSESSED IN THE GOLDEN PLAINS SHIRE STRATEGIC BUSHFIRE ASSESSMENT

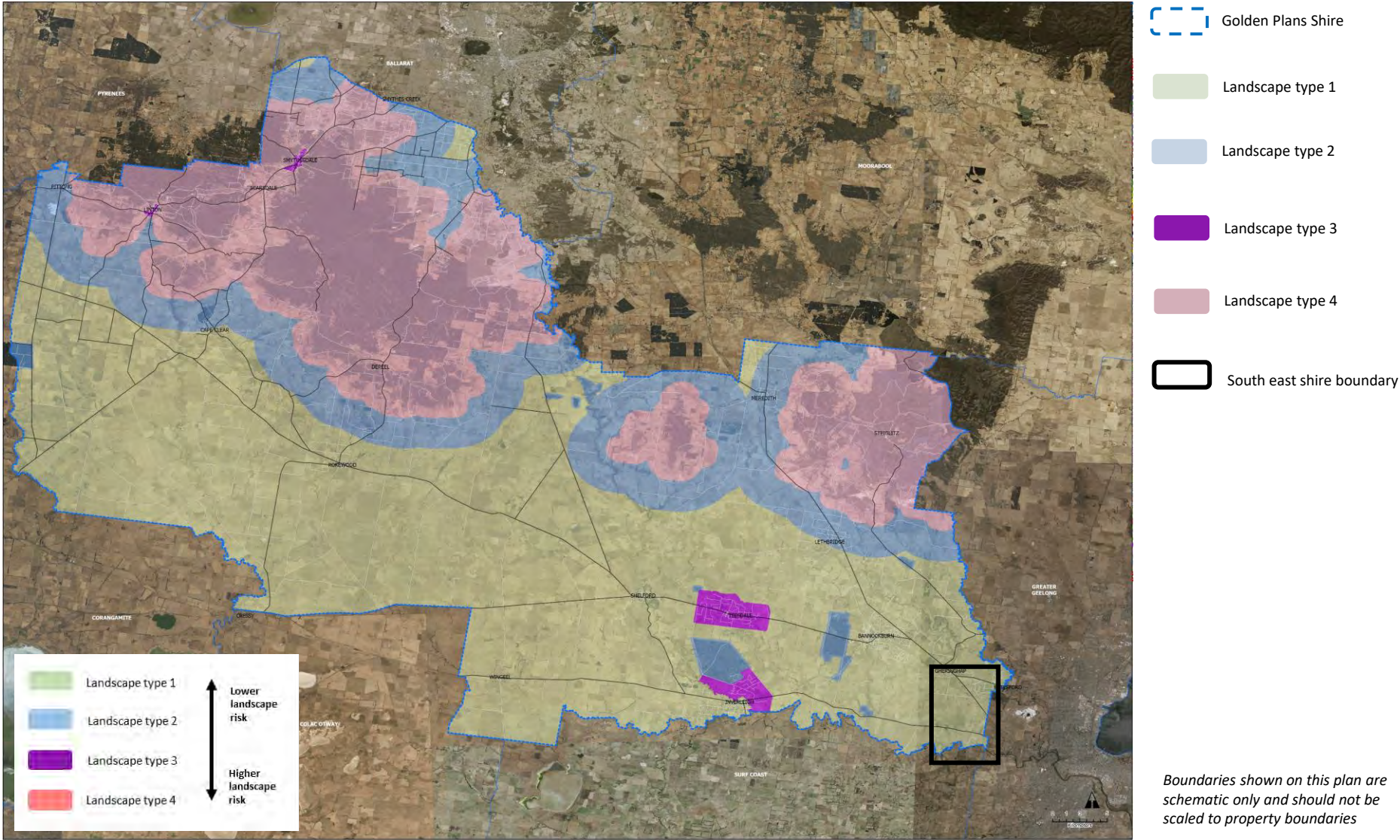


FIGURE 8B: CONTEXTUAL INFORMATION

Zones



Bushfire Management Overlay



Bushfire Prone Area



Slope based on 10m contour



FIGURE 8C: SOUTH EAST SHIRE BOUNDARY SETTLEMENT SCALE ASSESSMENTS AND RECOMMENDATIONS



9. Haddon

Haddon is in the north-western part of the Shire.

9.1 Golden Plains Shire Strategic Bushfire Assessment

The *Golden Plains Shire Strategic Bushfire Assessment* (2022) assessed Haddon as Landscape type 2 and Landscape type 4. Both landscape types arise from the lack of low fuel areas and proximity to large, forested areas to the south where extreme bushfire behaviour is to be expected. The area is in part at the higher end of bushfire risk in the Shire.

See Figure 9A: Location within Golden Plan Shire and landscape type

9.2 Contextual information

The following contextual information is relevant:

- The settlement of Haddon comprise land in the Township Zone. It adjoins land in the Rural Activity Zone to the north and west and land in the Rural Living Zone to the south.
- The Bushfire Management Overlay applies to non-grassland hazard areas to the immediate east of the settlement and land to the south, approximately 1.3km from the Township Zone.
- All of the settlement is within a Bushfire Prone Area.
- The slope of land is mostly flat.

See Figure 9B: Contextual information

9.3 Availability of safe areas at the settlement scale

c13.02-1S Bushfire Planning requires a location in easy reach that provides 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 are not reliably available in Haddon. The Haddon Recreation Reserve has adequate dimensions where it would be an area of BAL:Low (more than 50m from grassland hazards), and this area is currently a neighbourhood safer place providing some credibility to the management of land to be free of hazards.

Due the linear configuration of existing development, low fuel areas do not reliably arise due to the lack of a defined settlement edge, meaning there is some potential for a moving grassfire to penetrate into the settlement, especially in undeveloped lots and through larger developed lots within the Township Zone.

9.4 Site based exposure at the settlement scale

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 slope is mostly flat throughout the settlement and its surrounds.

Grassland is the assessed hazard. It arises on all sides of the area. Based on grassland, setbacks of 19m are generally required from bushfire hazards to achieve a radiant heat flux of less than 12.5kw/sq.m in completed development. This is highly achievable in new development. A site assessment as part of new development should be prepared to confirm site based exposure requirements are met.

The area of land to the east within Haddon Common Bushland Reserve would be assessed as forest. Setbacks of up to 48m (forest) are generally required from bushfire hazards to achieve a radiant heat flux of less than 12.5kw/sq.m in completed development. This is achievable in new development owing to the larger adjoining lot sizes, if they were to ever develop.

9.5 Discussion

Haddon is not optimised for directing growth. The elevated landscape risk and the assessment of Landscape type 4 (in part) positions the area at the highest bushfire 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.*

It is recognised however that Haddon is in a risk transition area. The risk arising from large hazard areas to the south progressively reduce as you move north. This is reflected in areas to the north-west of Haddon being in a Landscape type 2 area.

Decision making must ultimately make a decision as to the emphasis to be placed on the different policies in *c13.02-1S Bushfire Planning*. Where there was an emphasis on enhancing the resilience of existing areas through new development, an argument could be made for selected growth in Haddon which:

- Is directed to the north of the settlement, furthest away from forest hazards to the south.
- Creates a larger area of BAL:Low and affording additional protection to the Haddon Recreation Reserve.
- Creates a low fuel neighbourhood through planning requirements.

The above could enhance the overall resilience of Haddon, delivering a more viable settlement for sheltering for the wider area, including the extensive areas of low density lots throughout this landscape. The new areas would be over 3km from forest hazards to the south, which is extensive based on acceptable outcomes being achieved in other parts of Victoria.

Concurrently, it could also be argued that the risk is high and that the introduction of even more lots, likely to be larger than 1,250sq.m, simply replicates the extensive inappropriate development (from a bushfire perspective) adjoining and close to landscape-scale forest hazards in the northern parts of the Shire. Relative to other areas in the Shire and in the City of Ballarat, there are reasonable alternatives on a municipal and sub-regional scale to not need to increase risk at all in Haddon.

The balancing of this decision is one that can only be made by the Planning Authority in consultation with the relevant fire authority. It could however be a credible strategy to support the resilience of Haddon and surrounds by consolidate exiting areas through their development, resulting in less hazards in the settlement, and directing limited growth to the north, strengthening and making larger the low fuel areas in the settlement and as a place of shelter for the wider area.

What is considered 'limited' would be driven by delivering key bushfire requirements, such as the design of a neighbourhood-scale area of low-fuel land and a BAL:Low area and creating a defensible settlement edge.

9.6 Recommendations

1. The Planning Authority carefully works through the potential options for Haddon with the relevant fire authority.
2. Existing Township Zone land be developed and consolidated to reduce hazards within existing settlement areas.
3. Directing limited development to the north of existing Township Zone land, to enhance the resilience of the settlement overall by reinforcing low fuel areas and the role of Haddon as a place of shelter in the wider landscape. Development generally within 400m of the existing settlement would be workable basis to commence more detailed structure planning.
4. Structure planning should define a permanent settlement edge from which bushfire management can be planned. Once defined, the settlement edge should be optimised for bushfire by:
 - Requiring a perimeter road on the planned settlement / hazard interface separating development from grassland hazards. Where lots are fragmented, structure planning and a suitable planning scheme control should coordinate development on multiple sites to deliver perimeter roads.
 - Applying bushfire vegetation requirements to all land within new areas for development.

9.7 The broader area included in the Rural Activity Zone

The broader landscape to the north-west of Haddon includes land within the Rural Activity Zone. Presumably a lower-density form of development would be proposed, making this land likely unsuitable for development it would not have access to low-fuel areas and would simply replicate the extensive areas of inappropriate low density development across the north-western parts of the Shire.

Access from these areas to a low fuel area would be through extensive grassland areas that would likely be affected by grassfire, including an increased potential for ignitions based on the large forested areas to the south. It is unlikely a new 'settlement' would be created due to servicing constraints, when this is likely required to deliver a neighbourhood-scale area of low fuel as a place of shelter.

A number of enquiries, including the 2009 Victorian Bushfires Royal Commission and a more recent Auditor General report, identified low rates of compliance with bushfire-related planning permit conditions. This arises from a lack of landowner compliance and responsible authority compliance checks and enforcement activities.

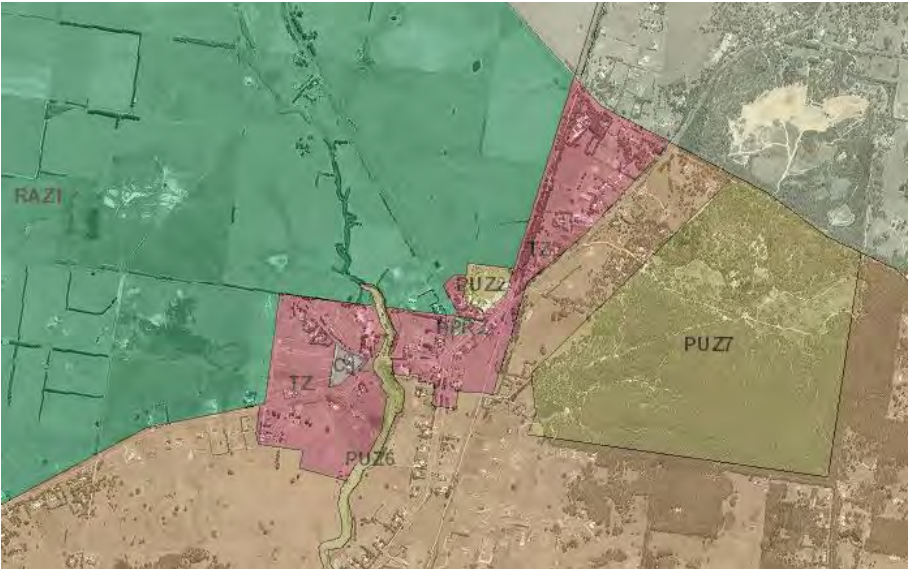
At this time, there would be a low level of confidence planning permit conditions alone would deliver a reliably low fuel area in conjunction with new development in such a large area and where not connected to a settlement. Limited reliance could also be placed on fire prevention planning, given the extensive areas of hazards on low density lots throughout this landscape which fire prevention planning has not prevented arising.

It is likely that the creation of a low fuel area would need to be supported by the weight of a neighbourhood safer place. These are planned and delivered by Councils under the Country Fire Authority Act 1953, with the Country Fire Authority providing a quality assurance role. The management of the areas are more reliably afforded Council management and typically arising as part of public land (for example, on public open space). More than 1 would likely be needed to ensure all places have ready access to a low fuel area.

On balance, it would be difficult to plan for, deliver and justify in a planning scheme amendment that further low density lots should be introduced into this broader landscape (the Rural Activity Zone land). There are relatively lower risk alternative locations available and absolutely lower risk location which should be emphasised in settlement planning. It is unlikely a planning scheme amendment to enable growth in these areas would be successful.

FIGURE 9B: CONTEXTUAL INFORMATION

Zones



Bushfire Management Overlay



Bushfire Prone Area



Slope based on 10m contour



FIGURE 9C HADDON SETTLEMENT SCALE ASSESSMENTS AND RECOMMENDATIONS

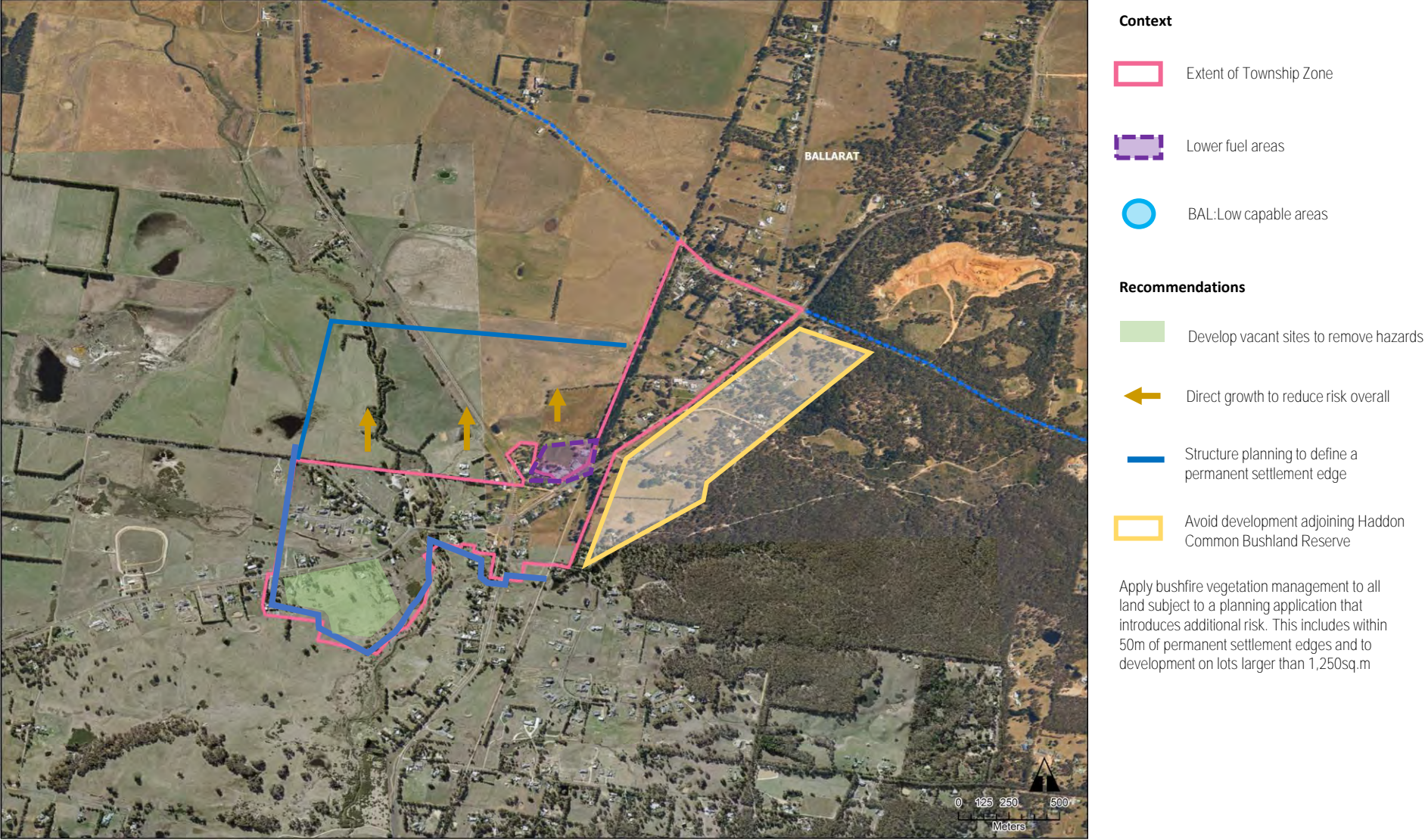
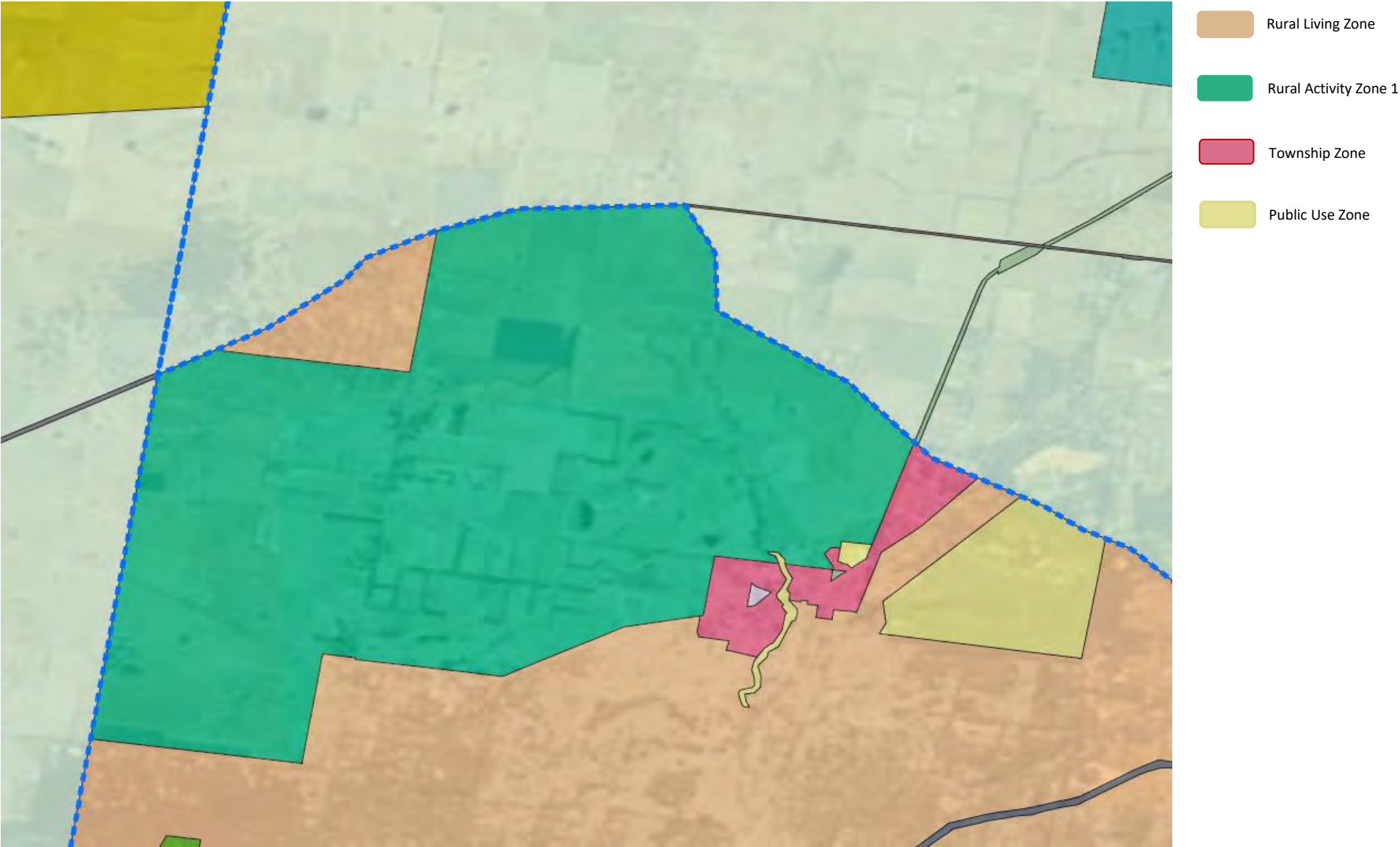


FIGURE 9D: RURAL ACTIVITY ZONE TO THE NORTH-WEST OF HADDON



References

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

Golden Plains Planning Scheme

2009 Victorian Bushfire Royal Commission (July 2010), *2009 Victorian Bushfire Royal Commission Final Report*

Victorian Auditor-General's Office (October 2020), *Reducing Bushfire Risks*

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