western plains north green wedge management plan

background report

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prepared by **hansen partnership pty ltd** in collaboration with ecology consulting, ochre imprints and ray phillips agribusiness

CITY OF MELTON

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1 introduction

As part of a wider suite of strategic planning projects the City of Melton has determined to undertake some long term planning for the land known as the Western Plains North Green Wedge, which sits within the municipality's boundaries. To undertake this work, Melton City Council have appointed hansen partnership to prepare the *Western Plains North Green Wedge Management Plan* (WPNGWMP). hansen will undertake this work with expert input from Ecology Consulting, Ochre Imprints (heritage) and Ray Phillips Agribusiness.

The overarching aim of this project, as outlined in the associated brief, is to provide a framework to support sustainable land use, land management, and development of the City of Melton's Western Plains North Green Wedge area. In order to achieve this aim, the project brief outlines the following key objectives:

- *Identify the agricultural resources, water resources, infrastructure, significant landscapes, significant flora and fauna, and heritage places within the Green Wedge;*
- *Identify the land capability and environmental conditions of the Green Wedge;*
- *Identify the land uses within the Green Wedge and the contribution that they make to the City of Melton, to the surrounding region, and to the wider Metropolitan area of Melbourne;*
- *Provide strategic guidance on the kinds of land use and development that will be permitted to make best use of its natural resources and the environment; and*
- *Recommend a range of regulatory and non-regulatory measures to protect and enhance the Green Wedge, and to manage its interface with the Urban Growth Boundary.*

In seeking to establish a strategic framework that addresses the wide range of issues which affect the study area, the project includes a number of important stages, as follows:

- *Extensive background reporting, based on site visits and desktop analysis, to identify existing conditions within the study area and to flag areas likely to need addressing within the Management Plan (stage 2);*
- *A stakeholder consultation session to test the desktop analysis, identify the 'big picture' issues and trends, and to begin the process of identifying appropriate principles (stage 3);*
- *Following this consultation the views expressed by stakeholders will be documented, along with an overall vision for the area. This vision will be developed on the basis of stakeholder feedback and the findings of the desktop analysis (stage 4);*
- *This vision will then be tested with the same stakeholders before the draft management plan is prepared (stages 5 and 6);*
- *The draft WPNGWMP will then be exhibited to the wider community before the plan is finalised (stage 7 and 8).*

1.1 what is a 'green wedge'?

Green wedges are the non-urban areas of metropolitan Melbourne that lie outside the Urban Growth Boundary (UGB, see section 3.2.1 for further explanation). There are twelve designated green wedge areas that collectively form a ring around Melbourne. Each green wedge is unique with its own range of key features and related values. These twelve green wedges are:

- Manningham;
- Mornington Peninsula;
- Nillumbik;
- South East;
- Southern Ranges;
- Sunbury;
- Werribee South;
- Western Plains South;
- Western Plains North;
- Westernport;
- Whittlesea; and
- Yarra Valley and Yarra and Dandenong Ranges.

The City of Melton is one of seventeen fringe municipalities within metropolitan Melbourne which contain these twelve green wedges. A green wedge is an area of land which has agricultural, environmental, historic, landscape, recreation and/or tourism value. Subsequently, intense urban development is precluded in these areas.

More specifically as documented in the Department of Sustainability and Environment (DSE) *Principles, Issues and Guidelines for Green Wedges* (2005), the role of the green wedges includes:

- *Providing opportunities for agricultural uses, such as market gardening, viticulture, aquaculture, farm forestry and broad acre farming*
- *Preserving rural and scenic landscapes*
- *Preserving conservation areas close to where people live*
- *Preserving renewable and non-renewable resources and natural areas (such as water catchments)*
- *Providing and safeguarding sites for infrastructure that supports urban areas (such as airports and sewage treatment plants)*
- *Allowing industries such as sand and stone extraction to operate close to major markets*
- *Enabling the development of networks of open space; and*
- *Providing opportunities for tourism and recreation.*

Figure 1: Melbourne's green wedges

An initial nine green wedges were established by the Hamer government in the early 1970s as non-urban areas that separated Melbourne's main urban development corridors. Directions on green wedges outlined appropriate non-urban uses including farming, flora and fauna reserves, native grasslands, open space, significant landscapes and resource utilisation areas. The extent and purposes of green wedges remained relatively unchanged until 1996. However, between 1996 and 2002 a large amount of land was removed from the green wedge areas to accommodate urban expansion and an Urban Growth Boundary (UGB) was established to secure the remaining land. However, a number of changes to the UGB have subsequently occurred and the impact of this is discussed further within the body of this report.

1.2 what is a green wedge management plan?

As part of the implementation of *Melbourne 2030* (the metropolitan planning strategy at the time) and the introduction of an UGB for Melbourne, the sitting Government introduced a process for the preparation of management plans for all of Melbourne's green wedges, mandating a consistent format. These plans are intended to

- *Enhance knowledge of the environmental, social and economic attributes of the non-urban parts of the City, including addressing issues of environmental degradation and economic viability of traditional farming methods.*
- *Enhance community knowledge and awareness of non-urban land use, development and management issues; and*
- *Identify initiatives to be undertaken by Councils, other bodies and a range of partnerships to ensure improved long term sustainable management of land and other resources in the green wedge areas.*

The relevant Practice Notes and Guidelines prepared by the State Government identify that a Green Wedge Management Plan (GWMP) should contain a number of key elements, relative to their particular areas. These elements include:

- An assessment of the context, both in relation to existing policy from both a Council and broader agency context. For the Western Plains North Green Wedge this assessment can be found in both the literature review at Appendix 2 and in the body of this Background Report.
- The development of an overall 'vision' for the areas, including the setting of goals and objectives.
- Identification of key issues based on the *"attributes and values of the area, its land uses, land ownership pattern, the social and economic conditions, the environmental qualities and the values, conditions and issues associated with the natural resource base."*
- The development of key themes that outline opportunities to address the identified issues through planning, environmental and native resource initiatives, infrastructure improvements, local actions, and partnerships.
- And finally, a series of actions to be taken by a range of stakeholders that will assist in achieving the overall vision outlined within the GWMP.

Core information in the preparation of the management plan should ideally include land capability, vegetation and habitat mapping, land ownership, land use, land condition and potential productive uses, location of significant natural sites and elements, landscape values, heritage sites and attributes, specific resources and hazards.

1.3 what is the study area?

'Green wedge land' within Melton is all located outside the Urban Growth Boundary (UGB) in the City of Melton. Green wedge land includes land that which is zoned as Green Wedge Zone (or Green Wedge A Zone), Rural Conservation Zone, as well as land in Public and Special Use Zones.

The City of Melton has two designated green wedges.

1. The Western Plains South Green Wedge is located in an area generally bounded by the Western Freeway to north; the Princess Freeway to the south where the Green Wedge crosses Wyndham's municipal boundary; the Melton South Township and farming land to the north east and east; and the municipal boundaries of Greater Geelong and Moorabool to the south west and west. While a Green Wedge Management Plan for the south is also required, given this Green Wedge overlaps municipal boundaries, Council has determined to undertake the development of the plan in conjunction with Wyndham City Council and so no consideration has been given to that area as part of this study.
2. The Western Plains North Green Wedge (the study area) is located in an area generally bounded by the Macedon Ranges municipal boundary to the north, the Melton Highway and existing and identified urban areas to the south; the Calder Freeway and the Diggers Rest to the east and the Moorabool municipal boundary to the west. The full extent of the area addressed by this plan is shown in Figure 2: Aerial on the following page.

Grazing land within the western plains north green wedge

Northern area of the green wedge

western plains north green wedge management plan

figure 2: aerial

legend

study area

shire of macedon ranges

shire of moorabool

toolern vale

black hill road

diggers rest-coimadai road

melton airfield

gisborne-melton road

city of hume

calder freeway

holden road

macpherson park

minns road

harkness road

mount kororoit

leakes road

melton highway

city of brimbank

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2 context: overview

This section briefly discusses the City of Melton and the study area from a broader perspective in order to understand its context within the wider region. This provides a sense of the wider connections that exist between the study area and its surrounds. In addition, it allows an understanding of the influences which may be felt within the study area.

2.1 regional context

The City of Melton is located approximately 45 kilometres west of Melbourne's central business district. The core township of Melton was originally established, along with Sunbury, as a 'satellite' town to metropolitan Melbourne. More recently the transition from a primarily rural to a primarily urban municipality has been acknowledged through the re-designation of Melton as a City (as opposed to its previous designation as a Shire). The urban area of Melton currently comprises two separate parts (in addition to the smaller township of Diggers Rest to the north-east) the township of Melton itself, and the Melton East area which forms the existing edge of metropolitan Melbourne. This Melton East area comprises the rapidly growing suburbs of Caroline Springs, Burnside and Hillside among others. This context is shown in Figure 3: Context Plan, on the following page.

Under current planning policy these two areas (Melton and Melton East) will eventually be joined by urban growth. This significant expansion means the City of Melton is one of Melbourne's key 'growth areas'. As result of this designation, large areas of the municipality are being planned and managed by the Growth Areas Authority, a specialised authority mandated with planning for growth areas. The growth areas in Melton are part of the Western Growth Corridor, while the identified expansion of the Diggers Rest township is part of the Sunbury Growth Corridor. Areas zoned Urban Growth Zone are divided into separate 'precincts' subject to a separate Precinct Structure Planning process.

The corridor plan identifies that the majority of the area between Melton East and the Melton township will be developed for residential purposes, with key centres of activity located at Toolern, where a new railway station will be provided, and also at Rockbank, Rockbank North and Plumpton. In addition, large areas of land have been identified for 'employment uses' in the south-east of the municipality and at the eastern edge of the existing Melton township, as well as near the junction of the Melton Highway and Plumpton Road where the proposed Outer Metropolitan Ring Road will be accessible. Key linear open space connections run along many of the areas creeklines, with a particular emphasis on the Kororoit Creek corridor.

The natural environment of the broader region is dominated by the Victorian Volcanic Plains, a vast ecosystem stretching across to the South Australian border. This ecosystem is dominated by grasslands and, as a result has been extensively modified since white settlement and is substantially compromised, with the original environment only remaining in small pockets. These small pockets remain under threat. One of the dominant features of these plains are a number of volcanic formations, and these small volcanos can be seen across the grasslands. Notable forms include Mount Cottrell and Mount Kororoit. There are other important environmental areas in the immediate surrounds including the Long Forest Flora Reserve, which, while primarily located in Moorabool Shire, extends across into Melton and contains a small but very important remnant of native Mallee vegetation.

However, to the north-east of Melton and beyond, a different landform is present, a more mountainous area which is mostly preserved as part of the Lerderderg State Park. While this park is primarily known for the significant gorge which is located within its boundaries, it also extends across to the east and includes the Pyrete Range within Melton. This hillier terrain, known locally as the Toolern Vale Hills, signals the transition from the Victorian Volcanic Plains to the western uplands of the state. These hills also contain areas of intact vegetation and provides habitat for a range of threatened fauna species.

There are also a number of important reservoirs which are located in or near these ranges including the Merrimu and Djerriwarrh Reservoirs which are fed from the surrounding hills. South of the study area, the most important waterway in the region is the Werribee River, which (typically of many waterways within the volcanic plains) cuts through the surrounding plains as a deeply incised corridor as it winds its way to Port Phillip Bay. As well as the Werribee River, there are a number of other significant waterways in the area, including the Lerderderg River, Kororoit Creek, Djerriwarrh Creek, Jacksons Creek, Parwan Creek and Toolern Creek.

adjoining municipalities

The City of Melton shares municipal boundaries with Macedon Ranges Shire to the north, Hume and Brimbank Cities to the east, the City of Wyndham to the south and Moorabool Shire to the west.

Adjacent to the City of Melton, Macedon Ranges is essentially rural, with the forested slopes of the Pyrete Range extending into this Shire, and the land to the north-east of City of Melton being primarily used for rural residential uses.

To the west, Moorabool is classified as a rural area. The northern section of the Shire adjacent to the City of Melton is primarily natural forested land, however, along the Western Freeway, the township of Bacchus Marsh is expanding rapidly close to the boundary with Melton. This boundary is marked by the deeply incised corridor along which flows the Djerriwarrh Creek. On the immediate boundary, south of the Western Freeway alignment is a low density residential estate known as Hopetoun Park

To the south of Melton is Wyndham City Council, which shares many of the characteristics of Melton, being the other core municipality within the Western Growth Corridor. While this municipality is the most removed from the study area, it is probably the Council with the closest relationship to the City of Melton due to the contiguous growth area. In addition, the City of Wyndham contains the southern portion of Melton's Western Plains South Green Wedge.

The municipalities of Brimbank and Hume to the east are essentially urban areas where they relate to Melton. Where land is not currently used for urban purposes, it forms part of growth corridors. The exception to this is the large area of land affected by Melbourne's Tullamarine Airport under an overlay which extends into Melton.

The Tullamarine Airport is located to the east of the City of Melton, in the southernmost part of Hume, and the area reserved from residential development due to an east / west runway alignments provide a clear break between the Western Growth Corridor and the Sunbury Growth Corridor (which includes Diggers Rest). The airport itself however has little relationship to the northern part of Melton due to the presence of two deep creek corridors (Jacksons and Deep Creek) and a lack of road connections which increase the sense of separation. The Sunbury Green Wedge is separated from the WPNGW by the Calder Freeway as can be seen in Figure 3.

The Western Freeway runs through the City of Melton (east to west) and provides a key connection between Melbourne and Ballarat. The Calder Freeway runs north-south and provides a key connection between Mildura and Bendigo to the north-west and Melbourne to the south east, as well as forming the eastern boundary of the municipality. A rail corridor also runs alongside the Calder Freeway, providing rail access to Diggers Rest.

Also important to note is that the alignment of the proposed Outer Metropolitan Ring Road (OMR), which is currently being planned to accommodate a 100 kilometre high speed transport corridor connecting Melbourne's north and west, is identified through the existing Green Wedge Zone in the study area to the east of Plumpton Road.

this park is primarily known for the significant gorge which is located within its boundaries, it also extends across to the east and includes the Pyrete Range within Melton. This hillier terrain, known locally as the Toolern Vale Hills, signals the transition from the Victorian Volcanic Plains to the western uplands of the state. These hills also contain areas of intact vegetation and provides habitat for a range of threatened fauna species.

Views along the Diggers Rest-Coimadai Road

western plains north green wedge management plan

figure 3: context plan

legend

- current urban areas
- urban growth boundary and growth areas
- parks and reserves
- infrastructure
- topographical formations
- road infrastructure
- waterbodies/creeks
- municipality boundaries

to bendigo (80km)
new gisborne
rosslynne reservoir
gisborne
23km from melton
western water purification plant
mount bullengarrook
little bullengarrook
mount gisborne
sunbury airfield
pyrite state forest
gisborne south
SHIRE OF MACEDON RANGES
CITY OF MELTON
SHIRE OF MOORABOOL
mount aitken
mount holden
lerderderg state park
sugarloaf
green hill
mount tophet
flagstaff hill
sunbury
18km from melton
proposed outer metropolitan ring road
djerriwarrh reservoir
toolern vale
HUME CITY COUNCIL
CITY OF MELTON
holden flora & fauna reserve
merrimu reservoir
melton airfield
diggers rest
SHIRE OF MOORABOOL
djerriwarrh creek
macpherson reserve
mount kororoit
organ pipes national park
melbourne airport
24km from melton
bacchus marsh
12km from melton
to ballarat (50km)
long forest flora reserve
BRIMBANK CITY COUNCIL
CITY OF MELTON
melton
melton tourism precinct
hillside
melton south
taylors hill
melton reservoir
CBD
45km from melton

2.2 municipal context

growth areas

As mentioned in the previous section, Melton forms part of Melbourne's significant growth areas. The five residential precincts planned to date (Melton North, Toolern, Rockbank North, Taylors Hill West and Diggers Rest) are estimated to accommodate over 97,000 new residents under the relevant Precinct Structure Plans (PSPs). The following PSPs have a direct interface with the study area:

- Melton North.
- Melton East.
- Warrensbrook.
- Plumpton.
- Digger Rest.

Of those precincts, planning has been completed for Melton North and Digger Rest. These areas are anticipated to accommodate 3,600 and 11,970 new residents respectively. Plumpton, which is one of the larger precincts, directly abuts the study area to the south of the Melton Highway to the east of the proposed OMR and early estimates have identified an additional 25,000 new residents may live in this area. It is anticipated that business uses will establish on either side of the OMR immediately adjacent to the study area (south of the Melton Highway). Pre-planning has commenced for this precinct.

The Melton North PSP envisages urban residential development up to Minns Road, with the road acting as a barrier between the urban and rural areas. The exception being immediately around Little Blind Creek where a landscape connection is shown through to the retarding basin area.

Figure 4: melton north PSP

The Diggers Rest PSP identifies urban residential development along the entire western interface, however, unlike Melton North, there is no road separation specifically identified as part of this plan. The southern interface with the study area is identified as an employment area along the northern side of the Diggers Rest–Coimadai Road.

Figure 5: diggers rest PSP

It should also be noted that additional land up to Minns Road to the north of Melton extending west to the proposed regional cemetery, and also a large area of land to the west across to Harkness Road have been included within the Urban Growth Boundary as part of the 'logical inclusions' process (2012). No plans have been prepared for these areas, although it is anticipated they will also provide a future residential interface with the study area.

urban areas

While it has been included within the study area given its locational characteristics, the settlement of Toolern Vale is actually located within an Urban Growth Boundary and as such is not affected by this Green Wedge Management Plan. It is a small, low density settlement located at the corner of the Diggers Rest-Coimadai Road and the Gisborne-Melton Road and bounded to the north by the Toolern Creek and associated reserve. The settlement has a small shop, park, CFA and a school.

Diggers Rest is currently a small township around the intersection of the Calder Freeway and the Melbourne-Bendigo rail line. Development here is much more urban and the township has a school, recreation facilities as well as a small commercial area. Under the PSP the township will quadruple in size and connect over the Calder Freeway to the Sunbury West growth area precinct.

The existing urban areas of the Melton township will interface with the study area in only a few key areas. To the east, there is little direct interface with the study area, which is separated from the urban areas by both the Toolern Creek and the Melton Highway both of which adjoin existing low density estates. To the west the one estate which has established will provide through access (via Claret Ash Boulevard) to Harkness Road and the study area. While Harkness Road in this vicinity will be sealed as part of the development of this estate, most of the residential areas within the estate turn their backs on the road and are accessed via internal cul-de-sacs.

To the north the existing residential estates are separated from the study area by Minns Road. As with development to the west, all dwellings turn their back on the study area, although to the east a landscape buffer has been established to the south of Minns Road. Access to the study area is provided via Black Knight Way, Archer Drive and the Gisborne-Melton Road, with additional pedestrian access available from Light Fingers Street.

The eastern extents of the study area interface with the suburb of Hillside. This suburb is separated from the study area by a transmission line easement, and as a result dwellings within this area are only accessed internally. To the north of this suburb there is more of a relationship to the study area, with a park providing a link and some road access.

2.3 key considerations and issues

Some of the key implications and issues raised by an analysis of the broader context include which should be considered in decision-making in the Green Wedge are:

- Appropriate interfaces between urban areas (or future urban areas) and the Green Wedge.
- Increased value of Green Wedge land due to reduction in rural land as a result of planned growth.
- Need for a response which acknowledges the very different landscapes which exit within the study area, particularly between the grasslands and the Toolern Hills.
- Impacts of key infrastructure such as the proposed Outer Metropolitan Ring Road and the Tullamarine Airport.
- Interface with the eastern parts of Diggers Rest.

3 context: controls

3.1 acts and legislation

The management of the Green Wedge area is subject to a number of controls and requirements within various legal frameworks. Some of these are Federal level Acts which require the protection of endangered species, as well as State level legislation to protect heritage and to ensure orderly planning.

A more comprehensive list of relevant legislation is provided at Appendix 1, but the following is a summary of the key matters:

- *Environment Protection and Biodiversity Conservation Act (EPBC Act*): the key piece of environmental legislation that enables the Australian, State and Territory governments to provide national environment and heritage protection and biodiversity conservation. It requires Federal approval of any actions which may impact on matters considered nationally significant.
- *Planning and Environment Act (P&E Act)*: sets out the framework for planning within Melbourne and is implemented though the Melton Planning Scheme, discussed in more detail in the following sections.
- *Local Government Act (LG Act)*: provides the legal framework for local governments to enact policies such as the City of Melton's Environment Enhancement Policy.
- *Victorian Heritage Act (VH Act):* the key piece of legislation that protects identified heritage places. There are two levels of protection that exist under this act; State level important sites which are then considered by Heritage Victoria, and more locally significant sites, which are considered by the relevant Responsible Authority.
- *Aboriginal Heritage Act (AH Act):* recognises aboriginal heritage and sets in place a framework for undertaking cultural heritage assessments in areas identified as being potentially significant to local indigenous groups.
- *Aboriginal and Torres Strait Islander Heritage Protection Act (ATSIHP Act*): Provides additional framework for protection of indigenous heritage at a Federal level.
- *Catchment and Land Protection Act (CALP*): established the Catchment Management Authorities who seek to manage water resources across a range of different areas to preserve enhance and protect water catchments.
- *Flora and Fauna Guarantee Act (FFG Act):* the key legislation for the protection of flora and fauna in Victoria which establishes a regulatory structure for the conservation of flora and fauna in Victoria. The *FFG Act* provides for the protection of native species and the preparation of Action Statements to protect the long-term viability of these values.
- *Water Act*: sets in place the legislative framework for management of water within the Victorian context, including relevant matters such as the protection of waterways.

3.2 state planning policy

The *Planning and Environment Act (1987)* is applied within Victoria through the State Planning Policy Framework, the Local Planning Policy Framework and the Victorian Planning Provisions.

The State Planning Policy Framework (SPPF) applies to the City of Melton as it does to all of Victoria. The overarching theme of the SPPF is *'to provide for the fair, orderly, economic and sustainable use and development of land'* and identifies a number of key objectives, the most relevant of which being 'to provide for the protection of natural and man-made resources and the maintenance of ecological processes and genetic diversity' (Clause 10). The following state policies are considered relevant to the WPNGWMP, and the management to be prepared must have regard to these matters.

clause 11.03 open space

This policy focuses on open space planning and management. It assists with the creation of a diverse and integrated network of public open space commensurate with the needs of the community and provides for the long term management of public open space.

clause 11.04-6 green wedges

The policy seeks to protect the green wedges of metropolitan Melbourne from inappropriate development by ensuring the strategic planning and land management of each green wedge area to promote and encourage its key features and related values. It seeks to protect important productive agricultural areas and areas of environmental, landscape and scenic value.

clause 12.01 biodiversity

This policy assists with the on-going protection and conservation of biodiversity, which includes the retention and the preservation of areas with native vegetation and animals. It also seeks to manage and control pest plants and animals. This policy seeks to achieve a net gain in the extent and quality of native vegetation by protecting areas with important biodiversity value through the application of appropriate land use planning strategies.

clause 12.04 significant environment and landscapes

This policy assists with the protection and conservation of environmentally sensitive areas, and landscapes and significant open spaces that contribute to character, identity and sustainable environments.

clause 13.05 bushfire

This policy assists with strengthening community resilience to bushfire by applying the best available science to identify vegetation, topographic and climatic conditions that create a bushfire hazard and assessing the risk to life, property and community infrastructure from bushfire at a regional, municipal and local scale. It also requires consultation with the relevant fire authority early in the strategic and settlement plan making process and identifies a number of matters that must be considered when planning for, or expanding an existing settlement in an area at risk of bushfire.

clause 14.01 agriculture

This policy assists with the ongoing protection of productive farmland which is of strategic significance at a local and/or regional scale. It seeks to encourage and promote sustainable management of agricultural land.

clause 14.02 water

This policy assists with the on-going protection and restoration (where possible) of catchments, waterways, water bodies and ground water. The policy seeks to protect and enhance water quality by ensuring that water resources are managed in a sustainable manner.

clause 14.03 resource exploration and extraction

This policy encourages the exploration and extraction of natural resources in accordance with acceptable environmental standards and to provide a planning approval process that is consistent with the relevant legislation. It seeks to protect the opportunity for exploration and extraction of natural resources where this is consistent with overall planning considerations and application of acceptable environmental practice and to provide for the long term protection of natural resources in Victoria.

clause 15.03 heritage

The policy assists with the conservation of places of heritage significance. It seeks to identify, assess and document places of natural and cultural heritage significance as a basis or their inclusion in the planning scheme and to provide for the protection of natural heritage sites and man-made resources and the maintenance of ecological processes and biological diversity.

clause 18.04-3 melbourne airport

This policy assists with strengthening the role of Melbourne Airport within the State's economic and transport infrastructure and protect its ongoing operation. It seeks to ensure the effective and competitive operation of Melbourne Airport at both national and international levels, ensure any new use or development does not prejudice the optimum usage of the airport, and ensure any new use or development does not prejudice the curfew-free operation of Melbourne Airport.

clause 19.03-5 waste and resource recovery

The policy seeks to avoid, minimise and generate less waste to reduce damage to the environment caused by waste, pollution, land degradation and unsustainable waste practices. It seeks to establish new sites and facilities to safely and sustainably manage all waste and maximise opportunities for resource recovery. It encourages facilities for resource recovery to maximise the amount of resources recovered and encourages waste generators, resource generators and resource recovery businesses to locate in close proximity to enhance sustainability and economies of scale.

clause 19.03-6 pipeline infrastructure

This policy assists with the planning and development of pipeline infrastructure to ensure that gas, oil and other substances are safely delivered to users and to and from port terminals at minimal risk to people, other critical infrastructure and the environment. It seeks to recognise existing transmission-pressure gas pipelines in planning schemes and protect from further encroachment by residential development or other sensitive

land uses and to plan new pipelines along routes with adequate buffers to residences, zoned residential land and sensitive land uses and environmentally sensitive sites.

3.2.1 urban growth boundary

As Melbourne has grown and expanded, particularly over recent decades, there has been erosion of the extent of the green wedges established by the Hamer government. As a result of some relatively significant losses of green wedge land, the Victorian government introduced a legislated urban growth boundary (UGB) in 2002. The purpose of the UGB is to restrict urban development within the boundary thus preserving and protecting the green wedge. As a legislated UGB, expansion requires approval from both the upper and lower houses of the Victorian Parliament. The same legislation that introduced the UGB also introduced the Green Wedge Zones to ensure the specific characteristics and objective of the green wedges was reflected in decision-making, where previously this land had utilised a suite of rural or other zones as appropriate.

While the new UGB was intended to provide certainty at the rural / urban fringe, there have been several expansions and logical inclusions to the UGB between 2002 and 2012, which have again applied pressure to the green wedges. Over the years there have also been a number of changes to the specified uses that have been allowed within the green wedge areas, creating some uncertainty as to the intended purpose of the areas. The definition or permanency of the UGB line may change again in the near future as the outcomes of the proposed new Melbourne Planning Strategy are likely to address the matter.

3.3 local planning policy framework

The Local Planning Policy Framework (LPPF) provides specific guidance and controls for the use and development of land from a local perspective. These policies are developed by local government as they have an intrinsic understanding and insight into the key issues, opportunities and constraints within their municipality.

The LPPF must have regard to the objectives of SPPF and must not contradict these policies. In this context, if there is a conflict / contradiction, the SPPF will take precedence.

The Local Planning Policy Framework is broken into two main sections. The first section (Clause 21) provides both an overview of the municipality and a framework for the future development and growth. This framework is supported by a number of objectives and strategies. The second section of the LPPF (Clause 22) contains local policies. These are provided where there is a need for additional guidelines or parameters which apply to particular types of development of areas within the municipality.

3.3.1 municipal strategic statement

Melton's current MSS is outdated and requires updating to reflect changes in existing circumstances, especially having regard to projected population growth, the level of change in growth areas and the rebranding of Melton from the Shire of Melton to the City of Melton. Council is therefore currently developing a range of strategies and plans (including this project) to assist in the rewrite of the MSS and local policies. This will ensure that the Melton Planning Scheme reflects both best practice and the existing conditions within the municipality.

However, there are a number of existing strategic aims which remain relevant considerations for this project, in particular Clause 21.04, which identifies the existing physical framework, dividing the municipality into eight main land units. The study area is primarily categorised as the 'Toolern Vale Hills' and the 'Mt Kororoit Hills and Plains'. The Harkness Road area is identified for rural residential uses. Also notable is the identification of Minns Road as the northern boundary for urban expansion, and the potential expansion of residential uses to the east of the Toolern Creek in the long term. This clause also identifies longer term residential expansion of Diggers Rest to the south. Both of these long term urban expansion areas are likely to have been superseded by growth area planning which seeks development in different areas.

Existing policy regarding the Toolern Vale Hills seeks to conserve the Toolern Vale Hills area for the benefit of current and future generations, and to discourage land use and development that would threaten the area's environmental integrity. Strategies to achieve this area identified as follows:

- *Discourage future rural residential subdivisions and small lot excisions from occurring throughout the Toolern Vale Hills.*
- *Discourage urban uses from occurring in the land unit.*
- *Protect sites of environmental significance and sensitivity from inappropriate development.*
- *Ensure that new development makes adequate provisions to address fire risk.*
- *Discourage the removal of native vegetation and the planting of exotic species.*
- *Encourage small-scale tourist operations to become established.*

Existing policy regarding the Mt Kororoit Hills and Plains seeks to encourage and protect the Melbourne Airport environs, the thoroughbred breeding and equine research industries and ancillary activities from inappropriate land use and development patterns. Strategies to achieve this area identified as follows:

- *Retain land in broad hectare parcels*
- *Develop clear boundaries for the urban area in order to give certainty to rural landowners.*
- *Discourage rural living development from locating in areas that would undermine the viability of agricultural activities.*
- *Discourage small lot excisions from occurring, unless new lots are provided with reticulated water and are connected to a sealed road that forms part of the municipal sealed road network. , or near areas that contain sensitive rural activities such as thoroughbred horse studs, viticulture, ostrich farms and the like.*
- *Discourage land use and development that would be adversely affected by or prejudicial to the continued operations of Melbourne Airport.*

3.3.2 local planning policy

The following local polices are relevant to the study area.

clause 22.01 residential land use policy

While this policy does not strictly apply to the study area, it identifies a number of relevant matters. It identifies the popularity of low density lifestyles within Melton and the particular characteristics which make effluent disposal an issue and the associated need for low density opportunities to be provided where they can connect to reticulated sewerage systems. It also seeks to:

- *Locate low density and rural living development in areas that can be or are connected to reticulated water and sealed roads such as the northern and western edges of Melton township and the southern edge of Diggers Rest, land at the eastern edge of Melton township is readily available for connection o reticulated sewerage and water services and is encouraged to be used for low density residential purposes.*
- *To ensure that the location of new low density and rural living development does not prejudice the logical expansion of urban settlements.*
- *To ensure that a low density or rural living development responds to the surrounding environment and maintains and preserves existing environmental features including the Djerriwarrh, Toolern and Kororoit Creeks and the Werribee River.*
- *To ensure that Toolern Vale maintains its role as a rural village.*

In addition, the policy identifies the need to prepare an Outline Development Plan for land to the west of Harkness Road, particularly to address issues of servicing, infrastructure construction, the preservation of areas of conservation and landscape value, fire risk and drainage.

It also identified specific areas for rural living development, with the Harkness Road area being one of two within the municipality. There is reference to design and siting guidelines in relation to the development of that area.

clause 22.02 a sustainable environment policy

This policy assists with the retention and integration of natural features and systems into development and seeks to preserve and protect existing vegetation, wetlands, creeks and grasslands into the design of new development. The policy encourages the creation of linear open spaces along creeks and drainage lines and use of overland flow paths and retarding basins to control storm water run-off thus improving water quality. It also seeks to:

- *Identify areas of botanical, zoological and geomorphological significance and ultimately protect them through overlay controls;*
- *Encourage developers to retain areas of extant vegetation, wetlands, creeks and grasslands and encourage the incorporation of these features in their design;*
- *Require that creek frontages be provided for public open space purposes in urban areas;*
- *Require that the operators of extractive industry sites contain all of the impacts of their operations within the boundaries of their land when abutting land is developed.*

clause 22.03 recreation and open space networks policy

This policy assists with encouraging the provision of passive and active recreation spaces; ensuring that open space is appropriately integrated with surrounding land uses and is responsive to natural landscapes and features; and to connect parcels of planned open space, residential, civic and commercial areas with existing and planned district and regional recreation facilities. It also seeks to encourage the creation of a major public open space link along the Toolern Creek between the northern edge of the Melton township and the Werribee River and along the Djerriwarrh Creek between the Diggers Rest-Coimadai Road and Werribee River by requiring creek frontages as part of open space contributions from developers.

clause 22.05 employment policy

Clause 22.05 identifies opportunities for the generation of employment within the City and policies to encourage and support these uses. Relevant to the study area are the following objectives:

- *To actively support the development of the thoroughbred and harness racing industries in the municipality.*
- *To support quality tourist developments that capitalise on and enhance the Shire's landscape, natural features and economic base.*

Under this clause it is also policy to:

- *Preserve areas of broad hectare farming land to allow for a range of agricultural activities and pursuits by discouraging small lot excisions adjacent to productive rural enterprises.*

There are some existing contradictions between the allowable subdivision under the Green Wedge Zone which allows the development of small lots (provided a larger lot is retained) and this policy which will need to be further explored through this project.

clause 22.08 rural land use policy

This policy assists with maintaining rural areas in sustainable agricultural uses and to provide opportunities for rural living in controlled, well planned, economically sustainable developments. It seeks to promote economic development, tourism and rural enterprises which are compatible with rural activities and to maintain and enhance the landscape of the rural areas by encouraging development that is in harmony with the rural landscape.

It is Local Policy to ensure that large tracts of agricultural land are clearly identified and set aside for productive agricultural activities; ensure that the location of future rural living uses does not prejudice the operation and expansion of efficient agricultural pursuits; and discourage rural living development and small lot excisions from occurring in areas of productive agricultural land or adjacent to areas identified for future stone extraction.

3.4 victorian planning provisions

The Victorian Planning Provisions are a comprehensive set of planning principles and provide a standard format for all Victorian planning schemes. The format includes the State and Local Planning Policy Frameworks, zones, overlays, particular provisions, general provisions, definitions and incorporated documents.

3.4.1 current study area zoning

Zoning provides a clear framework to guide the use and development of land. Land uses are separated into three categories:

- Section 1 is 'as of right' with no permit required,
- Section 2 uses are allowed but require a permit; and
- Section 3 uses are prohibited.

Zoning also identifies additional permit triggers and provides decision guidelines (in addition to the broader decision guidelines that can be found at Clause 65 of all Victorian planning schemes) that the Responsible Authority must consider when assessing an application.

The following provides an outline of the zones as they are currently applied within the study area. This zoning can been seen on Figure 7: Zoning. Details regarding the purpose of each of these zones can be found at Appendix 1, following the outline of the relevant Acts discussed above.

green wedge zone (GWZ)

The Green Wedge Zone is the dominant zone within the study area, and this sets the primary framework under which decisions must be made in relation to the land. The purpose of the zone is to promote sustainable land management, protect biodiversity and heritage and promote uses consistent with rural landscape. To this end a range of uses are permitted or prohibited within the area. The range of uses permissible or 'as of right' within the area is currently under review by the State Government, with the intent of providing additional flexibility to diversify land uses (see discussion at section 3.4.3).

In addition to the uses of the land, the zone also controls the minimum subdivision size. While there is a default minimum sub-division size of 40ha under the Green Wedge Zone (generally accepted to be the minimum for viable farming enterprises), a schedule to the zone allows this to be altered to local circumstances. Within the study area the schedule has divided the land into two different categories. The majority of the land is within Category A however land to the south of Minns Road, and also an area between the Toolern and Kororoit Creeks to the east of Melton township, is classified as Category B.

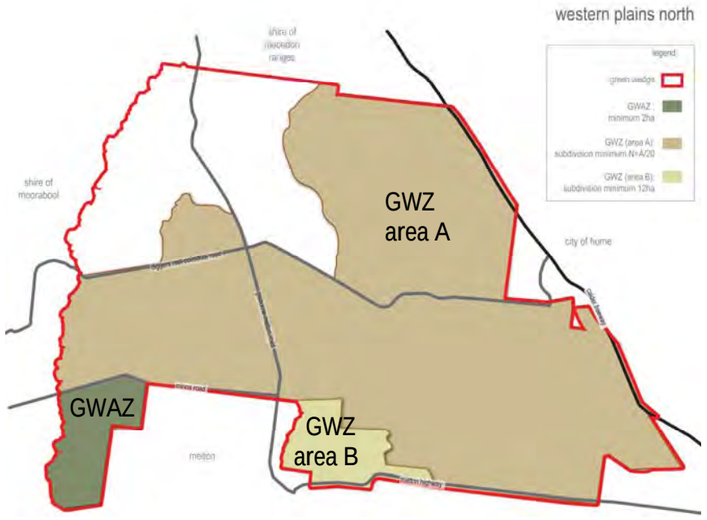

Figure 6: green wedge subdivision areas

In areas classified Category A, a formula is provided to guide decision making, as follows:

- *The number of lots into which the land may be subdivided is to be calculated using the following formula: N=A/20.*
- *Where N (rounded down) is the number of lots that can be created and A is the area of the land in hectares.*
- *The subdivision must comprise one large primary lot. The secondary lots must be at least 1.0 hectares and must be no larger than 5.0 hectares.*
- *An agreement under Section 173 of the Act must be entered into with the owner of each lot created which ensures that the land may not be further subdivided under this provision.*

Essentially, this seeks to allow small lots of between 1 and 5 hectares to be created (and presumably used for rural residential purposes), where this can be achieved while retaining a larger lot for the purposed of agriculture. A Section 173 agreement must be entered into to prevent further subdivision, however, this agreement is a subject of the current zone reviews being undertaken by the State Government expected to be released in early September 2013.

Within the Category B areas, the minimum subdivision size is 12ha, with no additional conditions or controls. This smaller overall size with no allowance for smaller rural living lots is presumed to be to retain the land for the longer term urban expansion opportunities identified in the framework plan at Clause 21.04 of the Melton Planning Scheme.

green wedge a zone (GWAZ)

Within the study area, the Green Wedge A Zone is applied only in one area – the south west corner between the urban area of Melton and the municipal boundary, below the alignment of Minns Road (the Harkness Road rural living area). Within the Melton Planning Scheme, the schedule to the GWAZ has been modified to apply a minimum subdivision size of 5ha to land within 300m of the Djerriwarrh Creek and to land within a PCRZ or PUZ. All other land within this area has a minimum subdivision size of 2ha, noting that the 'default' under this zone is 8ha. This smaller lots size reflects the different aims of the Green Wedge 'A' Zone, which explicitly recognises rural living areas.

rural conservation zone (RCZ)

The main area of RCZ land in the study area is located towards the north-west corner of the study area above the Digger Rest – Coimadai Road. There is also a band of RCZ land extending along the Djerriwarrh Creek.

public park and recreation zone (PPRZ)

Within the study area, the PPRZ applies to Macpherson Park Recreation Reserve. The zone is also present on smaller areas of public land such as along the Toolern Creek, near the intersection of the Kororoit Creek and Holden Road and in Toolern Vale.

public conservations and resource zone (PCRZ)

The Public Conservation and Resource Zone is applied within the study area in the north-west corner over the Pyrete Range section of the Lerderderg State Park and a small area in the south-west where the Long Forest Reserve is located.

public use zone (PUZ)

The Public Use Zone is present in the study area in a number of discrete areas. These are to the north-west around the Djerriwarrh Reserve (under PUZ1 – Service and Utility), to the south-west where the zone is applied to the land identified for the future regional cemetery (under PUZ5 – Cemetery / Crematorium) and two smaller parcels in the north-west and the south-east which are used by utility provider (under PUZ1 – Service and Utility). Public Use Zone 4 – Transport is applied with the study area along the alignment of the railway line to the south of Diggers Rest. In addition, small single sites affected by the PUZ6 – Local Government and PUZ7 – Other Public Use addresses can be found in the northern part of the Green Wedge.

special use zone (SUZ)

Within the study area, there are three separate areas where the SUZ applies. Two of these areas are quarries (the Hanson Diggers Rest Quarry on Black Hill Road and the Metro Quarries and Laboratory on the Melton Highway) and are affected by Schedule 1 to the SUZ - Earth and Energy and Resource Centres. The third area is in the south-east corner of the study area, where the Sydenham Terminal Station is affected by Schedule 3 to the SUZ – Terminal Stations.

road zone category 1 (RZ1)

The following Road Zone Category 1 roads are located within or at the interface of the study area: Calder Freeway, a north-west / south-east freeway connecting Mildura, Bendigo and Melbourne; Melton Highway, an east-west freeway connecting Ballarat and Melbourne; Diggers Rest-Coimadai Road, an east-west collector road and the Gisborne-Melton Road, a north-south collector road

3.4.2 interface zoning

The zoning at the interfaces of the study area will also influence what occurs within the study area, and the types of pressures which could be expected in adjoining areas. In particular the following zones which interface within the study area are relevant considerations.

low density residential zone (LDRZ)

The LDRZ applies to land in the Toolern Vale township and also to land around the Toolern Creek area. The smaller lot pattern and increased densities in these areas may mean increased pressure for subdivision adjoining those areas.

urban growth zone (UGZ)

The UGZ affects all land to the south of the Melton Highway, as well as some of the land around Diggers Rest which is associated with the 'growth areas'. That land is anticipated to accommodate standard urban development, primarily of a residential nature, in accordance with relevant schedules. Where the UGZ abuts the study area, intensive development can be expected, with associated pressures on the adjoining land.

3.4.3 proposed new zones

In July 2012, the Minister for Planning announced a reform of all Victorian planning zones. These zoning changes, if / when implemented, are likely to impact the different land uses and zones currently within the Green Wedge Zone. While changes proposed to the residential, commercial and industrial zones have been implemented, changes to the rural zones remain under consideration at the time of writing and are expected to be released in early September 2013. Broadly however, the draft changes proposed to:

- Remove the ability to require Section 173 agreements to prevent further subdivisions under the RCZ, GWZ and GWAZ;
- A greater range of uses would be possible 'as of right'; and
- A large number uses which were previously prohibited under the GWZ in particular, are now possible subject to a permit being granted.

This means that there is likely to be a need for additional policy direction regarding some uses which were previously prohibited in order to ensure consistent and clear decision making within the Green Wedge.

3.4.4 current study area overlays

Overlay controls support the underlying zoning of the land and provide additional levels of control primarily around built form or site responses to particular characteristics of the land, such as risk of wildfire. Often an overlay will be the trigger for assessment of an application where this may not be required though the zoning of the land.

The following provides an outline of overlay controls as they are currently applied within the study area, as shown in Figure 8: Overlays. Details regarding the purpose of each of these overlays can be found at Appendix 1, following the outline of the relevant zoning discussed above. It is worth noting that the introduction of new zones will not affect the overlays which currently apply to the land.

It is also worth noting that the amount of overlay controls present within the WPNGW are significantly less that can be found in many other green wedge areas, many of which have a large number of overlay controls triggering permit for both uses and development of land.

development plan overlay (DPO)

Development Plan Overlays are generally applied where there are multiple landowners and the need to ensure appropriate and co-ordinated outcomes.

The Development Plan Overlay – Schedule 3 is applied within the study area to the Harkness Road rural living area (essentially, land zoned GWAZ). This DPO was introduced when the new planning schemes came into Victoria and is currently under review due to the lack of specific guidance provided within the schedule. It is anticipated that an updated DPO schedule with more specific guidance (and the removal of the reference to outdated assessment tools) will be prepared in the future.

environmental significance overlay (ESO)

Environmental Significance Overlay is an overlay to identify where there are specific environmental matters that need to be considered and therefore permit triggers or development requirements over and above those identified by the underlying zone.

Within the study area, the ESO1 - Remnant Woodland, Open Forests and Grasslands is applied extensively in the northern areas, but also along roadsides, the Djerriwarrh Creek and other pockets of land. ESO3 - Wetlands, Waterways and Riparian Strips has been applied along all the main creeklines within the study area.

heritage overlay (HO)

The Heritage Overlay Schedule of each local government planning scheme lists sites of local and state significance (Victorian Heritage Register) and is used to protect sites that have heritage value, meaning that individual buildings or whole precincts may be covered. The protection afforded by a Heritage Overlay varies in each instance. The presence of a Heritage Overlay does not mean that development cannot occur but that the impact on the heritage asset must be considered.

There are no precinct based heritage overlays within the study area, however there are individual heritage overlays including homesteads, stone / blue stone cottages, outbuildings, dams, bridges, parks, farming stations and dry stone walls, particularly within the northern sections of the study area.

melbourne airport environs overlay (MAEO)

Within the study area, the Melbourne Airport Environs Overlay 2 has been applied. The purpose Schedule 2 is to identify areas that are or will be subject to moderate levels of aircraft noise based on contours and to limit use and development to that which is appropriate to that level of exposure.

public acquisition overlay (PAO)

Within the study area, the PAO Schedule 1 has been applied to land which is required for 'Future freeway – road works and access' purpose. This applies to same land immediately to the north of the Western Freeway at the junction with Harkness Road. PAO3 to the east of the study area is related to the proposed Outer Metropolitan Ring Road. In addition, PAO Schedule 8 has recently been applied to the land north of Hillside adjacent to the rail line intended for the Calder Park Train Stabling and Maintenance Yards, through Amendment C125.

significant landscape overlay (SLO)

Significant Landscape Overlays typically contain guidelines and permit triggers relating to built form, land form modification and vegetation, and seek to preserve and enhance the particular attributed associated with an area of significant landscape quality.

Within the study area Significant Landscape Overlay 1 (Volcanic Hills and Cones) applies to Mount Kororoit. Schedule 1 requires an application to construct a building or construct or carry out works on visible slopes generally above the 100 metre contour but below the above specified figures will be required to demonstrate how appropriate siting and landscaping treatment can be achieved.

bushfire / wildfire management overlay (BMO / WMO)

The Bushfire / Wildfire Management Overlay is applied on the basis of extensive mapping undertaken by DPCD following the Black Saturday Bushfire and applies in the western and northern parts of the study area, primarily on the forested slopes but also along the line of the Djerriwarrh Creek and another pocket of forested land on the north of the Study Area at the intersection of Black Hill Road and the Diggers Rest-Coimadai Road and over a plantation near Mount Tophet in the north-east.

This planning overlay requires that new development implements appropriate bushfire protection measures including the creation of "defendable space", (or space that reduces flame intensity and direct contact with a dwelling) around new dwelling. In many instances, people seeking to build in close location to native vegetation are required to modify the structural characteristics of the vegetation within the defendable space zone, meaning that any native vegetation is at best substantially removed within the "inner zone" close to a new dwelling, and usually highly modified in the "outer zone". Other requirements exist for subdivisions to create suitable fuel breaks between the vegetation hazard and housing.

The legislative requirements to provide defendable space and seek to protect native vegetation can be starkly competing priorities for Councils and planning referral authorities when considering a permit application for a new dwelling. House site options on a block can reduce the need for native vegetation removal and modification (both on the lot and adjoining land where it is permitted). However, many bush or semi-natural lots are constrained by house site options. Small lots adjoining or wholly within native vegetation are not compatible with the aim of retaining native vegetation given that the wide (~30-60 m) envelope of native vegetation removal/modification that must occur around the dwelling.

land subject to inundation overlay (LSIO)

The Land Subject to Inundation Overlay is applied to land which is subject to flooding impacts, generally along waterways. In the study are, this is only applied to a small area of creekline in the south-east of the Green Wedge area. The application of the overlay places restrictions on the types of buildings that can be constructed and introduces referral to the relevant authority.

3.5 key policy themes

Some of the key implications and issues raised by an analysis of the existing legislative and policy context include which should be considered in decision-making in the Green Wedge are:

- Legal requirements to actively protect and enhance habitat for identified flora and fauna.
- Need to ensure consistency with the State Planning Policy Framework.
- Recognition of the role of the Urban Growth Boundary.
- Incorporation of major open space linkages already identified in policy.
- Potential conflicts between policy positions, particularly in regards to small lot excisions.
- Changes to zone provisions and the need for additional policy direction.

Djerriwarrh Creek corridor

western plains north green wedge management plan

figure 7: zoning

shire of macedon ranges

shire of moorabool

city of hume

city of brimbank

western plains south green wedge

the gap

toolern vale

melton airfield

macpherson park

melton

melton tourism precinct

mount kororoit

diggers rest

taylors hill

black hill road

diggers rest-coimadai road

gisborne-melton road

holden road

calder freeway

minns road

harkness road

djerriwarrh creek

leakes road

melton highway

legend

- study area
- UGB - urban growth boundary
- GWZ - green wedge zone
- RCZ - rural conservation zone
- PPRZ - public park and recreation zone
- PCRZ - public conservation and resource zone
- FZ - farming zone
- DFZ - urban floodway zone
- R1Z - residential 1 zone
- LDRZ - low density residential zone
- PUZ - public use zone
- IN1Z - industrial 1 zone
- IN3Z - industrial 3 zone
- SUZ - special use zone

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Dwg No.:	UDD-003
Scale	NTS
Date:	26.06.13
Revision:	B

western plains north green wedge management plan

figure 8: overlays

shire of macedon ranges

shire of moorabool

city of hume

city of brimbank

western plains south green wedge

the gap

black hill road

toolern vale

diggers rest-coimadai road

melton airfield

gisborne-melton road

macpherson park

diggers rest

calder freeway

holden road

mount kororoit

leakes road

minns road

melton north

djerriwarrh creek

harkness road

melton

melton tourism precinct

melton highway

rockbank north

toolern

taylors hill west

taylors hill

legend

- study area
- public aquisition overlay
- bushfire / wildfire management overlay
- heritage overlay
- development plan overlay
- environmental significance overlay
- significant landscape overlay
- melbourne airport environs overlay
- land subject to inundation overlay
- environmental audit overlay
- development contributions plan overlay
- incorporated plan overlay

Project Ref:	12.547
Dwg No.:	UDD-002
Scale	NTS
Date:	22.03.13
Revision:	A

4 controls: governance and management

In addition to the legislation and planning controls which provide the framework for decisions within the Green Wedge, there are a number of other practices and activities which influence current conditions within the study area. Often these practices and programs are run by the City of Melton and other agencies, as well as community activity. While the preparation of the Green Wedge Management Plan is related to land use planning, by definition it also includes a consideration of a range of other actions which may improve the sustainable management of the land. An understanding of the existing systems and practices will assist in this consideration, and are therefore documented within this section. Also relevant are actions and strategies being undertaken by adjoining municipalities working within similar frameworks.

4.1 current city of melton practices

The City of Melton currently has a range of programs in place to manage the land within the Western Plains North Green Wedge, in addition to the two local planning policies which provide guidance on outcomes within the area.

Most important among these is the City's Environmental Enhancement Policy (EEP) which is intended to provide a financial incentive to landowners to improve the environmental condition of their properties.

The program provides for the delivery of a number of activities that are designed to enhance sustainable land use within the City of Melton. Under the program eligible owners of a property larger than two hectares are able to receive a rebate on their rates if they meet defined requirements for the control of noxious and environmental weeds, pest animals, especially the European Rabbits or soil erosion and other damaging processes. This scheme operates on an 'opt-out' basis, as opposed to requiring landowners to sign up. The scheme is structured and designed to make it as easy as possible for landowners to participate in the process and to maintain current high levels of participation.

Council provides a standard form which is sent to all eligible landowners, who then need to indicate what works they will be undertaking to improve the environmental performance of their property, including management of weed species. A failure to return the form is taken as an 'opt-out' and full Council rates are applied to that property. The scheme provides a positive incentive for landowners to undertake weed control, pest animal control, soil erosion and identification of native vegetation. After the 30th of September each year inspections of properties take place to ensure that the works identified have been completed. The scheme is a flexible one, and changes in circumstance and issues can be discussed and alternative arrangements agreed with Council. A withdrawal of the rebate on the grounds of failure to undertake agreed works can also be appealed.

The Council is also implementing the Victorian Volcanic Plains Grasslands Protection Program in cooperation with Hume, Moorabool and Wyndham Councils. $500,000 in Commonwealth funding has been provided for this program. The Volcanic Plains Grasslands are threatened by residential expansion, intense agricultural practices and a lack of knowledge and awareness about how to manage grassland remnants for long - term biodiversity conservation. The project is to provide support and continued education to property owners on how to best manage threatened grasslands and grassy woodlands for positive biodiversity outcomes.

Other activities supported by Council include "Living Green", water and waterways programs, participation in the 'Waterwatch' program (run by DEPI) and the encouragement of local groups to participate in Environmental awards.

Council also provides a central point of information about grants available through a range of organisations for improvements to land management within the Green Wedge area. This includes income that may be available through accepting "offsets" or the introduction of covenants.

The City of Melton also supports various programs run by the DEPI (previously DSE) including the 'Good Neighbour' program and other programs to control pest species such as rabbits. The City also supports and publicises weed reduction programs run by other government depearments.

4.2 adjoining municipality practices

The municipalities of Brimbank, Hume, Macedon Ranges, Moorabool and Wyndham adjoin Melton City Council's municipal boundaries. Given that the environmental attributes of these areas do not align with arbitrary municipal boundaries an awareness of the activities and land management practices in these adjoining municipalities is vital. Macedon Ranges and Moorabool are rural municipalities and do not have green wedges within their boundaries. Management of the land in those Shires is therefore under general agricultural land management processes. The table below summarises sustainable land management practices in Brimbank, Hume and Wyndham which all contain green wedge areas.

Municipality	Sustainable Land Management Practices
Hume	*Rural Areas Plant Donation Scheme* Provides rural landowners with a donation of locally native plants to undertake revegetation programs on their land. To be eligible the landowner's property of 2 hectares or more, with exceptions made where significant biodiversity values exist on the property. The number of 'free' plants varies between 50 and 300 depending on the type of project. *Land Management Rate Schemes* The scheme identifies sustainable land management as control and management of weeds, prevention of soil erosion, pest animal control and protection of native vegetation (amongst others). Unlike the Melton program, the Hume program is an 'opt-in' process as opposed to 'opt-out'. The scheme is broken into two categories. The *'Sustainable Farm Rebate'* is for landowners with property of 2 hectares or more, which is registered as farm land. Landowners who commit to implementing annual sustainable land management practices on their farm will receive a 23% rates reduction. The '*Sustainable Land Rebate'* is for landowners who do not have farm land status. Properties must be 0.4 hectares or more and zoned as Green Wedge, Green Wedge A, one of the Rural zones or Farming. Landowners who commit to implementing annual sustainable land management practices will receive a 15% reduction (up to a maximum of $1,000) based on the site value of the property. *Sustainable Land Management Strategy 2010-2013* The strategy examines the municipality's current situation in terms of invasive animals and plants, soil degradation, inappropriate land uses, climate change and drought, water, economic property viability, land use and demographics. The goal of the strategy is to improve land health and contribute to the sustainability of rural and environmental assets across Hume. The strategy's objectives are to prevent the establishment of new land threats, reduce the impact of existing land threats and enhance the capacity of commitment of all land managers to manage and solve land health problems.
Brimbank	*Brimbank Biodiversity Strategy 2012-2022* This document provides an overview of how Brimbank proposed to manage their biodiversity, outlining a vision for how the Council will protect, manage, connect and engage the municipality's natural areas. It outlines threats and opportunities and provides a series of actions including developing biodiversity indicators, a biodiversity connectivity plans and improving both monitoring of damaging behaviours and increasing community engagement and awareness. *Brimbank Green Wedge Management Plan* The Brimbank Green Wedge Management Plan was developed in accordance with the requirements set by the Department of Sustainability and Environment. The plan was adopted by the Brimbank City Council Planning Committee on 2 August 2010. It follows the prescribed structure for outputs with a focus on restoration and education.
Wyndham	*Land Protection Grant Scheme* To assist with conserving and protecting the natural environment and agriculture Council provides a grant to eligible landowners. The landowner submits an expression of interest, Council evaluates the proposal, if the proposed works are appropriate, Council appoints contractors to complete work. 25% of works are paid by landowner and 75% by Council. *Werribee South Green Wedge Policy and Management Plan* The Werribee South Green Wedge Policy and Management Plan was adopted by Wyndham City Council in October 2010. It follows the prescribed structure for outputs with a strong focus on community engagement and education. *Clause 22.08 Werribee South Green Wedge Policy* As an outcome of the Green Wedge Management Plan outlined above a new specific policy was introduced in the Wyndham Planning Scheme as a means of implementation.

4.3 other relevant activity

state government

State Government land management information services for the City of Melton area have been significantly reduced Department of Environment and Primary Industry (formerly DPI and DSE) now has a minimal presence in the area. This reflects the general move of State Government away from on-farm service delivery. Agency websites present a comprehensive range of base technical data but are frequently not up to date with the status of annual programs.

DEPI is responsible for the provision of advice on soil management including fertility, degradation and conservation and for the coordination of pest plant control programs for priority weed species such as Serrated Tussock (*Nasella trichotoma*). They are the body responsible for enforcement of land management practices but are relatively restricted in what can be achieved. Responsibility for the management and protection of native vegetation on private land rests with DEPI.

commercial advisory services

Specialist technical advice is available from agriculture service companies including fertilizer distributors, stock feed companies and major agricultural chemical distributors. These commercial bodies often provide a referral system and are one of the key areas where agricultural landowners currently access information about the management of their land.

community activity / landcare groups

An understanding of the local community groups operating in a study area is always useful to understand the interests of the residents or users of the area.

The study area has local interest groups who work towards enhancing the Green Wedge through various programs such as weed removal, planting of native vegetation, rubbish removal and monitoring native and pest species. Community based groups, particularly landcare groups, now play an important role in the flow of information on sustainable land use. Groups have better access to Departmental officers and to government grant programs than do individual landholders. Some members of groups have particular expertise in different aspects of sustainable land management that may be beneficial to other group members. The interest groups include Friends of Toolern Vale Creek, Harkness Road Community Group and Toolern Vale Landcare. They are independent, self-governing organisations. From time to time they received grants or funding from Council in order to conduct their sustainable land management activities.

Other groups which take an interest in the study area include the World Wildlife Fund (WWF) who have taken a role in protecting some of the remnant grasslands within the study area, and a number of groups who are interested more broadly in Victoria's western grasslands, such as the Keilor Plains Group

A number of Committees of Management have also been established through Council who play a role in managing small areas of mostly crown land, within the precinct including the Melton Gilgai Woodlands Nature Conservation Reserve and the Kororoit Creek Streamside Reserve.

There is also a range of sporting groups associated with both Toolern Vale and the MacPherson Reserve within the study area, although it is anticipated that their concerns will relate more closely with the operations within designated recreation reserves.

4.4 key considerations and issues

Some of the key implications and issues coming out of the governance controls which guide decision making in the Green Wedge are:

- The continued role of the EEP in improving land management.
- Access to information regarding sustainable land management practices.
- Role of community and management groups in maintaining land and improving biodiversity outcomes.
- Coordination between agencies and groups which providing funding for improvements across a range of areas.
- The role of State Government agencies in both funding and enforcing State level requirements for the management of land.
- The identification of locally relevant and achievable outcomes within an identified framework.
- Coordination of the outcomes sought through this project with those undertaken by both adjoining municipalities and relevant agencies, such as the Port Phillip and Westernport Catchment Management Authority.

Private landholdings offer important opportunities for revegetation

5 attributes: landscape

This section addresses the landscape values of the study area, not necessarily from an ecology perspective, but with a focus on how the landscape is 'read' on the ground. It addresses the key topographical features and the different landscapes within the study area, as well as addressing matters such as key views. An understanding of the types of landscape (i.e. forest, grassland etc) is necessary to ensure actions within the area are relevant to the particular issues associated with each of these areas. Along with key views, this understanding will inform measure to preserve and enhance the rural and scenic landscapes and the economic and social benefits that may be associated within these. A summary of matters relating to landscape is shown on the following page in Figure 9: Landscape and Environmental Values

5.1 topography

The Western Plains North study area has quite a distinct and varied topography. Across the southern portion of the study area, the land has a gentle rolling topography with slight rises intersected by a series of north / south creeklines. To the north-east however, these gentle hills become more pronounced and the creeklines more deeply incised.

The north-west has a very different landscape character, as above the Diggers-Rest-Coimadai Road the land rises relatively steeply into the Pyrete Range. This range manifests itself within the study area as two north/south aligned fingers extending down to the road. The western 'finger' forms part of the Lerderderg State Park (although it is not part of the main accessible area) and the eastern finger ends at the township of Toolern Vale. This eastern formation is separated from the Lerderderg State Park by a valley which has been substantially cleared of vegetation. A range of associated differences such as tree cover and deeper valleys contribute to a recognisable separation from the remainder of the study area, and indeed this area is defined within a separate 'bioregion' than the remainder of the study area.

One of the key topographical features and perhaps the landscape feature which most defines the study area is the presence of a number of volcanic hills. The most significant of these is Mount Kororoit located in the south-east of the study area, which is considered important at a State level. This key feature is covered by the areas only Significant Landscape Overlay in recognition of this importance. It is also perhaps the most highly visible of the areas feature, given its location and position within the more consistent flat grasslands in the south of the study area.

There are also a number of other important formations within the grasslands. Mount Tophet is a smaller formation but has a number of deeply incised corridors adjoining it and essentially forms a band across the northern boundary of the study area with Mount Aitken and Green Hill. Mount Aitken to the north is the most prominent of these formations, and shares many of the characteristics of Mount Kororoit (and Mount Cottrell further to the south).

5.2 tree cover

One of the other key features, which distinguishes the north-western part of the study area from the remainder, is the extent of tree cover in this area.

The substantially forested slopes of the public land in the north-west run down to the Diggers Rest-Coimadai Road. While there has been significant clearing in the adjoining valley, the tree cover also remains on the slopes of the ranges to the east. It is important to note though, that there is no connection in terms of tree cover between these two areas of steeper topography and this eastern section.

The significance of tree cover in the study area is emphasised by the relative rarity of consolidated areas of tree cover. Other pockets exist in the following locations:

- Along the Djerriwarrh Creek, including the associated tributary which ends at the Harkness Road Reserve;
- In a large parcel at the intersection of Ryans Lane and Diggers Rest-Coimadai Road;
- On Green Hill adjoining the Pyrete Range; and
- In a small but very heavily vegetated pocket close of Mount Tophet in the north-east

5.3 creeklines

Within the grasslands of the Victoria's Western Plains, the other defining feature (apart from the volcanic cones) are the deeply incised creeklines. These are also present within the study area. The most notable of these is the Djerriwarrh Creek corridor, which forms the western boundary of the municipality and is a significant gorge formation. Less deeply incised, but still notable is the Kororoit Creek corridor, which runs relatively centrally through the study area, splitting into two branches north of Holden Road. While less significantly incised than the Kororoit and Djerriwarrh Creek corridors, the corridors associated with the Toolern Creek (more notable within the southern section of the study area) are clearly recognisable in the landscape. Smaller creeks within the study area also contribute to the landscape values and many feed into the urban areas, where they are used as drainage or open space corridors. A network of smaller creeklines in the eastern part of the study area appears to have been heavily modified and dammed in many places.

It is also worth noting there is a significant area of swampland, which is located to the north of Holden Road in the vicinity of Mount Kororoit. This area is identified (along with Mount Kororoit) as one of the two significant landscape features in the study area. The site is one of very few depressions within the western plains to be so well defined and longer term restoration to a wetland site has been recommended.

5.4 grasslands

While the grasslands of the Western Plains have clear environmental significance, which will be discussed further in the following section, they also contribute to a strong and distinct landscape character which is often undervalued. While the grasslands have been heavily modified, the flatter ground offers sweeping views not found in other landscapes, and the grasslands are punctuated by pockets of vegetation along creeklines which punctuate this landscape and add visual interest.

5.5 views

While the views across the broader landscape of the study area are important. There are a couple of key areas this report identifies. Viewshed analysis undertaken as part of the Melton Environmental Atlas has informed this assessment, along with site visits. Important views into and through the study area which are visible from the public realm include:

- The open vistas across the north section of the study area to the hills beyond when viewed from the Calder Freeway;
- Views from the Melton-Gisborne Road looking back across the foothills, across the grasslands and to the Melbourne CBD;
- Views of Mount Kororoit from the surrounding roads, in particular from Leakes Road and Holden Road;
- Views along the Djerriwarrh Creek corridor from the old Western Freeway bridges, but also from Hardys Road;
- Views from the Diggers Rest-Coimadai Road and Black Hill Road south over the flatter land towards the Melbourne CBD;
- Views from the south of Diggers Rest and along Holden Road to Mount Kororoit.

5.6 key considerations and issues

Some of the key implications and issues raised by an analysis of the existing landscape include which should be considered in decision-making in the Green Wedge are:

- Value and high visibility of the landscape of rolling plains in the southern parts of the study area.
- Recognition of the forested slopes which screen development and may require different responses to grasslands.
- The role of incised creek corridors as defining element in the landscape.
- Limited tree cover in the majority of the study area.
- Importance of volcanic cones and high levels of visibility, particularly Mount Kororoit.
- Recognition of key views, including panoramic views across the study area from the Calder Freeway.

Open vistas across grasslands to Mount Kororoit

western plains north green wedge management plan

figure 9: landscape and environmental values

shire of macedon ranges

shire of moorabool

city of hume

city of brimbank

melton

taylors hill

western plains south green wedge

green hill

mount tophet

mount kororoit

flagstaff hill

djerriwarrh reservoir

djerriwarrh creek

toolern vale

melton airfield

diggers rest

melton tourism precinct

macpherson park

kororoit creek west branch

kororoit creek east branch

kororoit creek

toolern creek

little blind creek

black hill road

diggers rest-coimadai road

gisborne-melton road

holden road

leakes road

harkness road

minns road

melton highway

calder freeway

legend

- study area
- recreational reserves
- national parks and state parks
- conservation reserves
- bio-region 25
- areas of regional significance
- areas of national significance
- environmental significance overlay
- rural conservation zone
- significant landscape overlay
- identified growling grass frog habitat area
- 2.5m contours
- extent of tree cover
- major waterways
- incised creek corridors
- reservoir
- large lakes and dams
- swamps
- important viewpoints
- topographic formations

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6 attributes: environment

This section provides an overview of the geography and climate of the Western Plains North Green Wedge (WPNGW), as well as an inventory of the biodiversity assets that are found within this area. While it is noted that the available records for this area are relatively limited, nonetheless an understanding of where areas of particular environmental importance or sensitivity exists within the study area is fundamental to the preparation of any management plan.

6.1 climate

The climate in the WPNGW is a temperate, similar to other parts of Melbourne. Broadly, it has a mild winter season of low evaporation contrasted with warm to hot summer of high evaporation. There are distinct spring and autumn seasons between. Weather patterns are generally associated with high-pressure systems that move in a general west to east latitudinal direction. The close proximity to Bass Strait and the Southern Ocean can cause a moderating oceanic effect on climate compared to adjoining regions of Victoria further north. Other key attributes of the climate include:

- Increased precipitation in the elevated and higher relief areas of the north-east.
- Significant rainfall can occur at any time of year with sporadic seasonal patterns.
- The months of September (45.7 mm), October (49.7 mm) and November (47.8 mm) are the wettest period on average, with a drier period for the rest of the year (Bureau of Meteorology 2013b).
- The region can have significant localised storm events such as a notable Australian record on January 24, 1959 when 24 mm of rain were recorded within six minutes at Sunbury (Bureau of Meteorology 2013a).
- Mean daily maximum temperatures are available for Laverton, 25 km south of Melton (and the WPNGW) (Weather Station No. 087031) (Bureau of Meteorology 2013b). Temperatures are highest in January at 25.6°C and lowest in July at 13.7°C.
- The coldest month of July has a mean daily minimum temperature of 5.0°C compared to the warmest month, February, with overnight minimums of 14.2°C.
- Frosts are common in the WPNGW but are seldom widespread and restricted to areas of higher altitude and lower areas of night time cold air drainage.

The Australian Government has released projected climate change scenarios for Victoria (CSIRO 2007). Projections are relative to the period 1980–1999 and give an estimate of the average climate around 2030, 2050 and 2070 based on the Special Report on Emissions Scenarios (SRES) by the Intergovernmental Panel on Climate Change (IPCC 2000). The best estimate models project that by 2030:

- There will be a 2–5 percent reduction in annual rainfall
- A 0.6–1°C rise in temperature
- No to slight reductions in wind speeds
- A 2–4°C percent rise in annual potential evapotranspiration in the area.

By 2070, the annual mean temperature is projected to rise to between 1–2.5°C and annual rainfall is projected to be reduced by 10–20%.

This relatively limited rainfall has significant implications for the ability to undertake meaningful agricultural activity in the area without access to an alternative reliable water source.

6.2 natural regions and their ecosystems

Eighty-eight per cent of the WPNGW falls within the Victorian Volcanic Plain Bioregion, with the remaining 12% located in the Central Victorian Uplands.

The Victorian Volcanic Plain (VVP) encompasses 2.3 million hectares across south-west Victoria (10.3% of the state), extending from Craigieburn in the east to Portland in the west and from Colac in the south to Clunes in the north (Taylor et al. 2003). The region has been utilised extensively for agriculture since the late 1830s / early 1840s and today contains almost no unmodified natural vegetation. In most areas native plants have been replaced completely by introduced pasture grasses and pre-European remnant vegetation is now confined, almost entirely, to narrow linear strips along roadsides and railway reserves or in areas unsuitable for cultivation (e.g. rocky outcrops, sheltered gorges, cliff crevices). Grasslands are the most dominant ecosystem throughout the Bioregion, where trees and shrubs are either absent or restricted to watercourses and swamps or rocky hills and slopes bordering the plains (Foreman & Walsh 1993). Relative to other Bioregions, the species diversity of vegetation within the VVP is very low. Because very little natural vegetation remains, the Bioregion is defined largely on geological features, characterised by an extensive basalt plain (Foreman & Walsh 1993).

The WPNGW includes a diverse range of structural classes of vegetation: forest, woodland, shrubland, grassland and wetland vegetation classification types. The landscape patterning of vegetation is strongly dependent on the geological substrate with fertile basalt and alluvial soils providing for a mosaic of grassland and woodlands and the poorly fertile Palaeozoic sediments of the Uplands supporting woodlands and forests. On the plains in 1788:

- Areas of open native grassland would have been present on poorly drained heavier soils.
- Given the basalt derived fertile soils and good summer and spring rain, the grassland communities are usually dominated by the high biomass producing and fast summer growing Kangaroo Grass (Themeda triandra).
- Drier, basalt areas in the Green Wedge probably supported grassland communities originally dominated by spear- (Austrostipa spp.) and wallaby-grasses (Rytidosperma spp.).
- Inter-tussock spaces thought to have been maintained by Aboriginal burning supported a range of lifeforms including climbers, a wide range of daisies, small bushes, lilies and orchids.

Grasslands in the area typically intergrade to woodland communities with a grassy understorey forming a tapestry (mosaic) of grass and woodland. Where drainage of fertile soils improves the vegetation is more characteristic of woodland, particularly on undulating plains where a more diverse group of eucalypt species are present. On volcanic hills and rises where soils are even drier and shallower than the plains, eucalypts can give way to she-oak (Allocasuarina spp.) as the appropriately named Sheoak Hill suggests.

Within the VVP Bioregion, creeks, shallow drainage depressions, and ephemeral chains-of-ponds are common features among the woodland/grassland mosaic described adding to its complexity. These areas often have veneers of alluvial soils high in organic matter ranging in depth and extent. In some places, the alluvial soil can be metres thick forming floodplains, whilst in small depressions it can be an almost absent feature. Along the creeks and floodplains, tall eucalypt woodlands originally grew with a sparse mid-storey of tall shrubs (Acacia spp., Bursaria spinosa) and a grassy understorey including many herbs and rushes.

In the CVU Bioregion (and the Tertiary soils deposits of the Long Forest area), grasslands are replaced by forests and woodlands with an often sparse, increasingly shrubby (and occasionally grassy) understorey. On the high slopes and ridges, forests of stringybark eucalypts (E. macrorhyncha and E. obliqua) a co-dominant other species are common with drought-tolerant grasses and herbs and fern on cooler aspects and ericoid-leaved shrubs (including heaths and peas) on drier slopes. Down slope, a range of forest and woodlands types occur, often with box-ironbark eucalypts and a range of lifeforms including grasses, heaths, lilies and orchids forming a low to medium understorey (often sparse). At Long Forest area, the particular characteristics of the Miocene geology and other historical bio-geographical factors contribute to a unique flora of chenopods (blue-bushes and salt-bushes) as well as a southern outlier of Bull Mallee (E. behriana) a more common species north of the Great Dividing Range.

Grasslands of the green wedge

ecological vegetation classes (EVCs): past and present

Victoria has developed a state-wide coordinated approach to vegetation classification, called Ecological Vegetation Classes (EVCs). These descriptions have been developed through consideration of floristic and structural information as well as other biotic (i.e., life-form and reproductive strategies), and a biotic factors (aspect, elevation, geology and soils, landform, rainfall, salinity and climatic zones) (DPI 2008). EVCs establish mapping units used for biodiversity planning and conservation assessment and are afforded conservation status under the *P&E Act* via the Framework.

Figure 10: Pre-settlement EVCs displays the estimated distribution of EVCs throughout the WPNGW prior to European settlement. Modelling by DSE suggests that in 1750 the area was dominated by grassy vegetation, including Plains Grassland (52% of overall cover), Plains Grassy Woodland (16%) and Plains Woodland–Plains Grassland Mosaic (13%). Forest EVCs constituted a relatively minor percentage of the overall vegetation, with Box Ironbark Forest the most abundant EVC in this community (9% of the WPNGW).

Based on the most recent vegetation cover data (2005), only 22% of the overall estimated EVC cover from 1750 remains throughout the WPNGW. Today forest communities comprise the largest percentage of native vegetation, including Box Ironbark Forest (32% of overall cover), Grassy Dry Forest (10%) and Heathy Dry Forest (8%). The once dominant grassy communities now exist in small isolated remnants (Figure 11: Post settlement EVCs and Table 1), with only 9% of the estimated 1750 cover of Plains Grassland remaining, while the cover of other grassy EVCs have likewise been reduced greatly.

EVC Name	Conservation Status	Bioregion[1]	1750 extent (ha)[2]	2005 extent (ha)[2]
Box Ironbark Forest	Vulnerable/Depleted	CVU / VVP	1942 *[9 %]*	1438 *[32]*
Plains Grassland	Endangered	VVP	10729 *[52 %]*	947 *[21]*
Grassy Dry Forest	Depleted	CVU / VVP	576 *[3 %]*	457 *[10]*
Plains Woodland/Plains Grassland Mosaic	Endangered	CVU / VVP	2580 *[13 %]*	437 *[10]*
Heathy Dry Forest	Least Concern	CVU / VVP	431 *[2 %]*	379 *[8]*
Plains Grassy Woodland	Endangered	CVU / VVP	3260 *[16 %]*	339 *[8]*
Grassy Woodland	Endangered	CVU / VVP	655 *[3 %]*	230 *[5]*
Shrubby Dry Forest	Least Concern	CVU	116 *[1 %]*	116 *[3]*
Creekline Grassy Woodland	Endangered	VVP	186 *[1%]*	40 *[1]*
Plains Sedgy Wetland	Endangered	VVP	44 *[< 1%]*	35 *[1]*
Stream Bank Shrubland	Vulnerable/Endangered	CVU / VVP	36 *[< 1%]*	32 *[1]*
Rocky Chenopod Woodland	Vulnerable	CVU / VVP	26 *[< 1%]*	17 *[< 1%]*
Shrubby Foothill Forest	Least Concern/Depleted	CVU / VVP	12 *[< 1%]*	13 *[< 1%]*
Plains Grassy Wetland	Endangered	VVP	23 *[< 1%]*	6 *[< 1%]*
		TOTAL	**20 618**	**4 486**

[1] CVU = Central Victorian Uplands; VVP = Victorian Volcanic Plain.
[2] Figures in square brackets represent contribution to the percentage of overall EVC extent.

Table 1: EVC extent within the study area (courtesy of DSE 2005b)

threatened ecological communities (EPBC Act)

The *EPBC Act* protects nominated plant communities, including three likely to be within the study area. They are:

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain (Critically Endangered) (analogous to Grassy Woodland EVC in Table 3),
- Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia (Endangered) (analogous to Plains Woodland EVC), and
- Natural Temperate Grassland of the Victorian Volcanic Plain (Critically Endangered) (analogous to Plains Grassland; and possibly Plains Grassland/Plains Grassy Woodland Mosaic).

Nationally listed ecological communities are well defined by condition threshold criteria, and are not the same (in nomenclature or definition) with either ecological communities listed as threatened under the *Flora and Fauna Guarantee Act 1988*, or more broadly defined communities identified through the Ecological Vegetation Class classification system. The broadly analogous system of EVCs are indicative that nationally listed ecological communities may be present and that further assessments are needed to determine the extent of such communities and referral to the Australian Government.

threatened ecological communities (FFG Act)

The state *Flora and Fauna Guarantee Act 1988* lists four communities in the study area as Threatened. As per the nationally listed communities, confusion between nomenclature and definition does occur with similarly named and broadly defined EVCs. Listing has particular importance for management of public land. The listed communities are:

- Grey Box – Buloke Grassy Woodland Community. Common throughout the area including woodlands dominated by E. microcarpa and Allocasuarina luehmannii (Buloke) with a grassy understorey (Scientific Advisory Committee, 1998). The community is noted to include woodland remnants near Melton and is similar to the Grey Box (E. microcarpa) Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia above.
- Victorian temperate-woodland bird community. This relates to the bird assemblage dependent on temperate woodlands including mention of box-ironbark communities (Scientific Advisory Committee, 2001). This bird assemblage uses the woodland and forest vegetation communities found within the Green Wedge.
- Rocky chenopod Open-scrub community. This plant community has an extremely restricted distribution because of its '*narrow ecological requirements*'... further... '*depleted through residential development and agricultural activities*' (Hills et al. 2003). Long Forest represents the largest remnant of this community (i.e. all ~200 hectares) (Hills et al. 2003). of which part occurs within the WPNGW.
- Western (basalt) plains grasslands community. Broadly includes grassland communities on basalt soils of the Victorian Volcanic Plain.

Council should seek to protect the above listed communities in accordance with the *FFG Act* and published Action Statements. Action can include:

- Transfer of land to the crown for conservation purposes.
- Changes in status of existing crown land to the conservation estate.
- Promotion and adoption of freehold conservation management (Trust for Nature, BushBroker, etc).
- Mapping and documentation, management and research initiatives.
- Community education and participation initiatives.

Specific actions have been recommended for each listed community. One important goal is for the Western (basalt) plains grasslands community Action Statement (DSE n.d.) that *"for remnants on private land on the urban fringe...ensure that all significant remnants of grasslands and grassy woodlands are securely protected and managed for their biodiversity values and that, where appropriate, restoration and enhancement of degraded remnants is undertaken to improve the viability of the remnants".*

The protection of these areas will require the resolution of two key matters. Firstly, accurate identification of where remnant vegetation remains and secondly, consideration of how this can be managed on private land. Much of these plant communities within the Green Wedge are in private ownership. This creates issues with the management of these vegetation communities, particularly in co-ordinating various parties with potentially conflicting agendas. The ability to easily access information about the specific practices which will be of most benefit to different plant communities also needs to be considered.

western plains north green wedge management plan

figure 15: land capability

shire of macedon ranges

shire of moorabool

city of hume

city of brimbank

melton

taylors hill

western plains south green wedge

the gap

diggers rest

toolern vale

melton airfield

macpherson park

mount kororoit

melton tourism precinct

32001-58

32001-36

52009-12

52010-02

52009-01/2

black hill road

diggers rest-coimadai road

gisborne-melton road

holden road

calder freeway

minns road

leakes road

melton highway

djerriwarrh creek

harkness road

legend

- study area
- toolern vale hills
- toolern vale hills
- toolern creek alluvial deposits
- melton red soils
- kororoit grey clays

0 80 160

40 120 200m

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Dwg No.:	UDD-012
Scale	NTS
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Revision:	B

western plains north green wedge management plan

figure 11: post settlement EVC's

shire of macedon ranges

shire of moorabool

city of hume

city of brimbank

melton

taylors hill

the gap

toolern vale

diggers rest

melton airfield

mount kororoit

melton tourism precinct

diggers rest-coimadai road

black hill road

kororoit creek west branch

kororoit creek east branch

gisborne-melton road

little blind creek

toolern creek

holden road

kororoit creek

leakes road

melton highway

calder freeway

minns road

macpherson park

harkness road

djerriwarrh creek

legend

- study area
- box ironbark forest
- creekline grassy woodland
- grassy dry forest
- grassy woodland
- heathy dry forest
- plains grassland
- plains grassy wetland
- plains grassy woodland
- plains sedgy wetland
- plain woodland/ grassland mosaic
- rocky chenopod woodland
- shrubby dry forest
- shrubby foothill forest
- stream bank shrubland

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6.3 significant flora

Within both areas protected for conservation (such as the State Park) and areas of farmland unprotected, the WPNGW has many records of plants of conservation significance. Table 2 and Figure 12 summarise records of significant flora species located within the WPNGW. Two species of national significance (listed under the *EPBC Act*). They are:

- Spiny Rice-Flower (Critically Endangered)
- Large-headed Fireweed (Vulnerable).

An additional 17 species of state significance (*FFG Act* or DSE advisory listed), consisting of six small to medium shrubs, six herbs, four grasses, and one tree. A cluster of significant flora records occur along the Djerriwarrh Creek in the Long Forest area (west of Melton), with the remaining records distributed widely around Toolern Vale and in the area between Melton, Sydenham and Diggers Rest. The Long Forest cluster also includes the most southerly occurrence of Bull Mallee in Victoria (Myers et al. 1986).

	Common Name	Scientific Name	Year of Most Recent Record	Total No. of Records	EPBC[1]
Nat. Sig.	Spiny Rice-flower	*Pimelea spinescens subsp. spinescens*	2008	13	Critically Endangered
	Large-headed Fireweed	*Senecio macrocarpus*	2001	4	Vulnerable
State Significance	Brittle Greenhood	*Pterostylis truncata*	2006	37	
	Small Scurf-pea	*Cullen parvum*	2006	5	
	Tough Scurf-pea	*Cullen tenax*	1994	2	
	Melbourne Yellow-gum	*Eucalyptus leucoxylon subsp. connata*	2008	1	
	Arching Flax-lily	*Dianella sp. aff. longifolia (Benambra)*	2006	1	
	Branching Groundsel	*Senecio cunninghamii var. cunninghamii*	1994	1	
	Cane Spear-grass	*Austrostipa breviglumis*	1992	4	
	Fragrant Saltbush	*Rhagodia parabolica*	1987	3	
	Giant Honey-myrtle	*Melaleuca armillaris subsp. armillaris*	2006	1	
	Half-bearded Spear-grass	*Austrostipa hemipogon*	1990	1	
	Heath Spear-grass	*Austrostipa exilis*	1992	3	
	Snowy Mint-bush	*Prostanthera nivea var. nivea*	1991	2	
	Western Golden-tip	*Goodia medicaginea*	1993	1	
	Yellow Burr-daisy	*Calotis lappulacea*	1983	1	
	Black Roly-poly	*Sclerolaena muricata var. muricata*	1987	2	
	Curved Rice-flower	*Pimelea curviflora var. aff. subglabrata*	1994	1	
	Plains Joyweed	*Alternanthera sp. 1 (Plains)*	2006	2	

[1] *Environment Protection and Biodiversity Conservation Act* 1999.
[2] *Flora and Fauna Guarantee Act* 1988.
[3] Advisory List of Rare or Threatened Plants in Victoria (DSE 2005a).

Table 2: significant flora in the study area (courtesy of DSE 2010)

6.4 significant fauna

The Western Plains North Green Wedge supports a diverse range of fauna and their habitat. There have been 223 native species recorded in the area. Due to the position between the uplands and plains it provides for a diversity of habitat types. Moist and deep fertile soils along creeks, gullies and depressions provide resource rich, large trees supporting nectar feeding birds, and large hollow dependent avian and arboreal mammal species. During drought conditions, these areas become particularly important refuges for the survival of many species. As many of these habitats have been cleared for agriculture, there is a special importance for the continued survival of remaining large trees "scattered" in paddocks, and the few remaining treed areas in linear roadside reserves. Creekline, and floodplain vegetation both within forested and farm land are also important areas in this regard.

Many small mammal species, ground birds and most reptiles are dependent on ground habitat. Habitats include cracking soils and old root "shafts", fallen woody debris, leaves, large logs, stumps, and surface rocks. The space requirements of ground dependent species can range greatly from species with wide home ranges to largely sedentary reptiles and insects. The nationally Critically Endangered listed Golden Sun Moth lives in grassy habitat of the plains and populations separated by more than 200m of non-habitat are considered effectively isolated from each other (Clarke & O'Dwyer 2000). Meanwhile, the mostly ground hunting Spot-tail Quoll, the largest marsupial carnivore of mainland Australia, has become became locally extinct due to the loss of a broad range of habitat requirements due to land uses including agriculture and forestry. Ongoing human activities such as removal of rocks and litter, fuel reduction burning, and inappropriate ploughing and stock grazing significantly contribute to the local loss and inevitably the extinction of many fauna species dependent on ground habitat. Saving remnant grassland and woodland, as well as ecological features of non-intensive open-space agriculture in the Green Wedge would be particularly important for many remaining populations such as the Fat-tailed Dunnart. This species, listed as vulnerable in Victoria, appears to be able to survive well in the agricultural landscape if its habitat requirements are maintained.

The WPNGW is fortunate to have a significant area of forest within its boundaries and to the north-west. The connectivity of this habitat, and re-linking patches of native vegetation, especially along creek lines (as they have higher nutrient and water availability) is important to support the population viability of many mobile birds, reptile and mammal species.

There are considerably more species records for birds (n = 177 species) than any other taxon type recorded in the Green Wedge (Table 4). Many are common and widespread bird species that generally reflect the agricultural landscape and include the Australian Magpie, Superb Fairy-wren, Galah and many others. Mammals are well represented and again are characteristic of the predominance of agriculture (n = 32 species; e.g. Common Brushtail Possum, Eastern Grey Kangaroo). Other groups include reptiles (n = 17; e.g. Bougainville's Skink, Tiger Snake), amphibians (n = 10; e.g. Common Froglet, Spotted Marsh Frog) and fish (n = 7; e.g. Common Galaxias, Short-finned Eel). The invertebrate fauna is poorly understood, with only three records of two species available, and both species are of conservation significance (refer to the following section).

Many introduced species are common and widespread throughout the WPNGW. Nine exotic mammal species have been recorded, comprising 31% (n = 73) of all mammal records (Table 3). Noteworthy introduced mammal species include the Red Fox, European Rabbit, Cat and House Mouse. Eleven introduced birds species have also been recorded, including the Common Myna and Common Starling which are both listed among 100 of the world's worst invasive species (Lowe et al. 2000). Moreover, there is one recent record (2006) of the Eastern Mosquitofish which is recognised as a significant threat to native fish populations in Australia (NSW NPWS 2003).

Taxon Type	No. of Species[1]	No. of Records[2]
Amphibians	10	93
Fish	7 *(3)*	9 *(3)*
Invertebrates	2	3
Mammals	32 *(9)*	239 *(73)*
Mussels, Decopod Crustacea	1	2
Non-passerine Birds	75 *(3)*	682 *(10)*
Passerine Birds	95 *(8)*	1616 *(199)*
Reptiles	17	67
Waders	7	34
TOTAL	**246 *(23)***	**2745 *(285)***

[1]Figures in parentheses = number of introduced species recorded.
[2]Figures in parentheses = number of records of introduced species.

Table 3: summary of fauna records in study area (courtesy of DSE 2010)

Records of significant fauna species located within the WPNGW are summarised in Table 4 and Figure 13. Five species of national significance are listed, including 2 bird species, one mammal, one frog and one invertebrate—the Critically Endangered Golden Sun Moth. Twenty-four species of state significance are listed, including 19 bird species, two mammals, one amphibian, one invertebrate and one reptile. For the majority of species, the most recent record is dated 1990 or earlier, with only four species recorded within the last decade (Swift Parrot, Golden Sun Moth, Speckled Warbler, Diamond Firetail). The spatial distribution of records is largely clustered along the Djerriwarrh Creek, north-west and south east of Toolern Vale, and between Melton and Diggers Rest. The clustering of records appears to be a result of survey area preferences by the Royal Australasian Ornithologists Union (now Bird Life). There has been insufficient fauna survey effort across the Green Wedge to establish a clear understanding of landscape patterns of fauna diversity.

The importance of connectivity of the Green Wedge landscape through protection of the creeks and native vegetation has been thoroughly demonstrated by a study of birds of the Long Forest between 1981 and 2005 (Hewish et al. 1996). Among many findings, the study found that the area is a home to an isolated group of woodland inhabitants that apparently use the Coimadai and Djerriwarrh Creeks as regional flyways for both seasonal movement as well as possibly more uncommon events of immigration and emigration. The area has been observed providing temporary drought refuge to more common inland species (Peaceful Doves and Pallid Cuckoos), as well as supporting many endangered species and populations of locally uncommon inland species

	Common Name	Scientific Name	Year of Most Recent Record	Total No. of Records	EPBC[1]	FFG[2]	DSE[3]
National Significance	Golden Sun Moth	*Synemon plana*	2006	2	Critically Endangered	Listed	Critically Endangered
	Regent Honeyeater	*Anthochaera phrygia*	1933	1	Endangered	Listed	Critically Endangered
	Spot-tailed Quoll	*Dasyurus maculatus*	1883	1	Endangered	Listed	Endangered
	Swift Parrot	*Lathamus discolor*	2007	5	Endangered	Listed	Endangered
	Growling Grass Frog	*Litoria raniformis*	1990	5	Vulnerable	Listed	Endangered
State Significance	Barking Owl	*Ninox connivens*	1990	2		Listed	Endangered
	Brown Toadlet	*Pseudophryne bibronii*	1990	2		Listed	Endangered
	Brush-tailed Phascogale	*Phascogale tapoatafa*	1936	2		Listed	Vulnerable
	Bullant	*Myrmecia sp. 17*	1969	1		Listed	Vulnerable
	Caspian Tern	*Hydroprogne caspia*	1977	1		Listed	Near Threatened
	Crested Bellbird	*Oreoica gutturalis*	1990	1		Listed	Near Threatened
	Diamond Firetail	*Stagonopleura guttata*	2004	6		Listed	Vulnerable
	Eastern Great Egret	*Ardea modesta*	1977	2		Listed	Vulnerable
	Grey-crowned Babbler	*Pomatostomus temporalis*	1933	1		Listed	Endangered
	Hooded Robin	*Melanodryas cucullata*	1989	4		Listed	Near Threatened
	Painted Honeyeater	*Grantiella picta*	1990	1		Listed	Vulnerable
	Speckled Warbler	*Chthonicola sagittata*	2006	6		Listed	Vulnerable
	Common Sandpiper	*Actitis hypoleucos*	1977	1			Vulnerable
	Musk Duck	*Biziura lobata*	1977	1			Vulnerable
	Royal Spoonbill	*Platalea regia*	1989	4			Vulnerable
	Black-chinned Honeyeater	*Melithrepterus gularis*	1989	3			Near Threatened
	Black-eared Cuckoo	*Chrysococcyx osculans*	1990	3			Near Threatened
	Brown Treecreeper (south-eastern ssp.)	*Climacteris picumnus victoriae*	1990	5			Near Threatened
	Fat-tailed Dunnart	*Sminthopsis crassicaudata*	1989	1			Near Threatened
	Latham's Snipe	*Gallinago hardwickii*	1979	2			Near Threatened
	Nankeen Night Heron	*Nycticorax caledonicus hillii*	1970	2			Near Threatened
	Spotted Harrier	*Circus assimilis*	1990	2			Near Threatened
	Spotted Quail-thrush	*Cinclosoma punctatum*	1989	3			Near Threatened
	Bearded Dragon	*Pogona barbata*	1986	1			Data Deficient

1. Environment Protection and Biodiversity Conservation Act 1999.

Table 4: significant fauna in the study area (courtesy of DSE 2010)

western plains north green wedge management plan

figure 12: significant flora

shire of macedon ranges

shire of moorabool

melton

city of brimbank

city of hume

taylors hill

toolern vale

melton airfield

diggers rest

the gap

melton tourism precinct

macpherson park

diggers rest-coimadai road

melton highway

minns road

holden road

leakes road

black hill road

gisborne-melton road

little blind creek

toolern creek

korroit creek west branch

korroit creek east branch

korroit creek

djerriwarrh creek

harkness road

calder freeway

2006 10
2006 10
1980 17
2008 1
1987 2
1987 17
1987 18
2002 10
1987 2
1987 2
1993 5
9
1994 7
1994
1992
1991 18 17 4
1992
1990 16 10
2002 10
1981 17 10
1989 17 14
1993 12
1983
1987 6
1993 12
1994 12
2006 13 15
19 12
2006
2006
1993 12
1994 12
1982 11
2004 19
2001 11
2008 8
2006 3
2006

legend

study area	
Melbourne Yellow-gum	1
Melbourne Yellow-gum	2
Giant Honey-myrtle	3
Snowy Mint-bush	4
Western Golden-tip	5
Black Roly-poly	6
Curved Rice-flower	7
Spiny Rice-flower	8
Branching Groundsel	9
Brittle Greenhood	10
Large-headed Fireweed	11
Small Scurf-pea	12
Tough Scurf-pea	13
Yellow Burr-daisy	14
Arching Flax-lily	15
Half-bearded Spear-grass	16
Heath Spear-grass	17
Cane Spear-grass	18
Plains Joyweed	19
date of record	1993

*note: locations are approximations only.

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figure 13: significant fauna

shire of macedon ranges
the gap
city of hume
diggers rest
shire of moorabool
diggers rest-coimadai road
melton airfield
toolern vale
black hill road
korroit creek west branch
korroit creek east branch
gisborne-melton road
little blind creek
toolern creek
macpherson park
minns road
holden road
leakes road
calder freeway
tierniwarth creek
harkness road
melton
melton highway
melton tourism precinct
city of brimbank
taylors hill

legend

- study area
- 1 Barking Owl
- 2 Black-chinned Honeyeater
- 3 Black-eared Cuckoo
- 4 Brown Treecreeper
- 5 Caspian Tern
- 6 Common Sandpiper
- 7 Crested Bellbird
- 8 Diamond Firetail
- 9 Eastern Great Egret
- 10 Grey-crowned Babbler
- 11 Hooded Robin
- 12 Latham's Snipe
- 13 Musk Duck
- 14 Nankeen Night Heron
- 15 Painted Honeyeater
- 16 Regent Honeyeater
- 17 Royal Spoonbill
- 18 Speckled Warbler
- 19 Spotted Harrier
- 20 Spotted Quail-thrush
- 21 Swift Parrot
- 22 Brush-tailed Phascogale
- 23 Fat-tailed Dunnart
- 24 Spot-tailed Quoll
- 25 Brown Toadlet
- 26 Growling Grass Frog
- 27 Bullant
- 28 Golden Sun Moth
- 29 Bearded Dragon

date of record 1993

*Note: Locations are approximations only.

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6.5 water catchments

The WPNGW is located within the Werribee Catchment which covers approximately 270,000 ha (PIRVic 2007). The main waterways within the WPNGW are:

- Djerriwarrh Creek
- Kororoit Creek
- Toolern Creek / Yangarook Creek
- Little Blind Creek.

No data on discharge for these waterways are available, but in the Werribee Catchment more broadly, rivers are highly regulated to manage water supply for urban and industrial activities as well as for irrigation, rural, and environmental uses. Data for stream condition are not available for Yangardook Creek, but the condition of Djerriwarrh-, Kororoit-, and Toolern Creek ranges from moderate to very poor (Victorian Governmnet 2004; PIRVic 2007). Elevated nutrient levels which exceed guideline maximums have been recorded in each of these waterways (EPA 2000) including nitrogen from urban and agricultural runoff and phosphorous around urban areas (PIRVic 2007).

Merrimu Reservoir is used primarily to supply drinking water to Melton and Bacchus Marsh with some water also used for irrigation in the Werribee Irrigation District. The maximum storage capacity of Merrimu Reservoir is 32,215 megalitres (Southern Rural Water 2013). Water is supplied locally from the Merrimu Water Filtration Plant supply system which includes Melton, Toolern Vale and surrounding areas. The current water yield for the Merrimu supply system is 12,090 megalitres per year.

Water and sewage services in the WPNGW are provided by Western Region Water Corporation (trading as Western Water). Water recycling is an important addition to the supply needs of the region, with sewage and trade waste from both domestic and commercial applications collected and treated at Recycled Water Plants (RWPs). During 2011/2012, approximately 2600 megalitres of recycled water from the Melton RWP was used for irrigation (agribusiness and recreational surfaces) and to water residential gardens, flush toilets and for fire fighting (Western Water 2012b). Groundwater is also used to supplement surface water for irrigation (PIRVic 2007).

6.6 conservation estates

There are eight public conservation reserves within the WPNGW, encompassing approximately 770 hectares which equates to 3.7 percent of the WPNGW. Moreover, there are at least two Council-managed conservation reserves (Ryan's Lane Woodland and Missens Road, both near Melton) as well as areas of significant roadside vegetation and remnant native vegetation on private land (City of Melton n.d). The key conservation areas within the study area are as follows (see also Figure 14: Public Conservation Reserves)

- *Lerderderg State Park* covers approximately 20,000 hectares in total, of which almost 630 hectares (3.2%) occurs within the WPNGW, north-west of Toolern Vale (Figure 14). This is the largest reserve within the WPNGW and it protects several Dry Forest EVCs including Box–Ironbark and Grassy Dry Forest (Figure 11). Within 100m of the park (and within the WPNGW) there is one record of the Brittle Greenhood (2006) which is listed under the *FFG Act*. There is also one record for the Black-eared Cuckoo (1986) which is listed on the Victorian Advisory List of Threatened Vertebrate Fauna (Near Threatened).
- *Yangardook Bushland Reserve* is situated less than one kilometre south of the Lerderderg State Park; the two areas being interconnected by an unreserved bushland. The site is not formally reserved for conservation purposes but is managed in accordance with government-accepted Land Conservation Council recommendations (VEAC 2011). The 50-ha reserve consists entirely of Box–Ironbark Forest EVC (Figure 12) and contains one record of Cane Spear-grass (1980) which is listed as Rare on the Victorian Advisory List of Rare or Threatened Plants.
- The *Melton Gilgai Woodlands Nature Conservation Reserve* (also known as the Harkness Road Reserve) located north-west of Melton, incorporates approximately 33 ha of the endangered Plains Woodland–Plains Grassland EVC mosaic (Figure 12). The reserve is a site of botanical significance in western Melbourne (McDougall 1987) with over 80 indigenous plant species recorded along with several declining woodland birds such as the Diamond Firetail and Brown Treecreeper (Melton Environment Group 2009). The reserve contains one record for the Swift Parrot (2007) and Growling Grass Frog (1989) which are listed as Endangered and Vulnerable under the *EPBC Act* respectively. There are also records of Heath Spear-grass (1992) and Cane Spear-Grass (1992) within the reserve, both of which are listed as Rare on the Victorian Advisory List of Rare or Threatened Plants.
- The *Long Forest Flora and Fauna Reserve* covers approximately 510 hectares in total, of which roughly 31 hectares (6.1%) occur within the WPNGW (west of Melton) (Figure 14). The area includes land of important conservation significance along the Djerriwarrh Creek both within and immediately adjoining the Green Wedge study area (Parks Victoria 2003). The reserve contains two EVCs within the WPNGW; Plains Woodland–Plains Grassland mosaic (Endangered) and Rocky Chenopod Woodland (Vulnerable) (Figure 12). The latter EVC is listed as Rocky Chenopod Open-scrub Community under the *FFG Act* as Threatened. The reserve contains one record for the Diamond Firetail (2004) which is listed under the *FFG Act* (Vulnerable). There are also records of the Western Golden-tip (1993) and Fragrant Saltbush (1987) within the reserve, both of which are listed as Rare in Victoria. Just outside the study area, many historical and contemporary records are available for the Long Forest for birds including Swift Parrot, Barking Owls, Brown Treecreepers, Speckled Warblers, Black-chinned Honeyeaters, Crested Bellbirds and Diamond Firetails (Hewish et al. 1996). As many of these species are migratory and/or have large home ranges the occurrence of some of these species in the Green Wedge is highly likely from time to time. Other species have been in the area but are no longer recorded: Australian Bustards, Bush-stone-curlews, White-browed and Grey-crowned Babblers, Plains-wanderers, Southern Whitefaces and Hooded Robins. Many of these species would have once inhabited the grasslands and woodlands of the area but are now locally extinct.
- The *Kororoit Creek (Holden Road) Streamside Reserve* includes 13 hectares of Plains Grassland and Creekline Grassy Woodland EVCs (Figure 12), both of which are endangered in the Victorian Volcanic Plain Bioregion. There is a record of the Growling Grass Frog (1987) within 50m of the reserve, which is listed as Vulnerable under the *EPBC Act*.
- Other small reserves in the WPNGW include *Chapmans Road Reserve* for which a record of the Brown Toadlet (1989) occurs within 60 m (*FFG listed*) and two *Natural Features Reserves* along Toolern Creek; at Toolern Vale and Benson Road. The latter reserve contains a record of the Growling Grass Frog (1988: Vulnerable under the *EPBC Act*) and the Diamond Firetail (1988: *FFG listed*).

western plains north green wedge management plan

figure 14: public conservation reserves

shire of macedon ranges
shire of moorabool
city of hume
city of brimbank
taylors hill
melton
mount kororoit
the gap
diggers rest
toolern vale
melton airfield
macpherson park
melton tourism precinct
black hill road
kororoit creek west branch
kororoit creek east branch
kororoit creek
toolern creek
gisborne-melton road
little blind creek
holden road
leakes road
diggers rest-coimadai road
minns road
harkness road
djerriwarrh creek
melton highway
calder freeway

legend

- study area
- crown reserves

reserves

1. lerderderg state park
2. toolern creek natural features reserve (benson road)
3. long forest flora and fauna reserve
4. yangardook bushland reserve
5. chapmans road reserve
6. toolern creek natural features reserve (toolern vale)
7. kororoit creek (holden road) streamside reserve
8. melton gilgai woodlands nature conservation reserve

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6.7 loss of native ecosystems

Victoria has a poor record of protecting and maintaining the biodiversity values of western areas of Melbourne as urban areas have expanded. This is in the context of temperate grasslands being Australia's most threatened ecosystems (Kirkpatrick et al. 1995). The loss and decline of native vegetation in the Victorian Volcanic Plains (VVP) area of the Green Wedge rapidly occurred with the settlement of Victoria, with few examples of remnant native vegetation, which now largely occur in road reserves and other areas of current/former public land. Ploughing and the addition of nutrients, particularly phosphorus, and other forms of soil disturbance (e.g. vehicle tracks) have had immediate and detrimental consequences to grassland communities.

Undisturbed areas show a remarkable resilience to weed invasion and small areas can still support a wide diversity of flora and fauna, including many threatened plant and animal species. But once disturbed, the incursion of weeds in many areas is of major concern and causes loss to biodiversity. It is a failure of policy and planning that many processes leading to vegetation loss and decline are contemporary. A study comparing native grasslands between 1985 (an estate of 7230 hectares present) found that by the year 2000, 1670 ha (23%) had been lost to development, and a further 1469 ha (21%) had been degraded to non-native grassland (Williams et al. 2005). Although, the Native Vegetation Framework has likely slowed the rate of loss, there is considerable pressure on grassland remnants to accommodate urban expansion, and transport infrastructure renewal and development.

The Central Victorian Uplands (CVU) includes grassy vegetation communities that have had similar pressures for agriculture. Forest and Woodland communities both within the VVP and the CVU bioregions have also faced significant declines. For instance, the Rocky Chenopod Woodland EVC (Vulnerable) (Rocky Chenopod Open-scrub - FFG-listed community) has been reduced by two thirds between c.1960 and 1986 in the Long Forest area (Myers et al. 1986). Rivers and stream side vegetation has likewise been affected with free access of stock to stream sides and streams.

The State, and the Green Wedge, has a major conservation estate (Lerderderg State Park) in remnant forest and woodland vegetation communities. The retention of these features is due to government legislation and policy from as early as the 1880s that have planned for the preservation and subsequent conservation of forests in Victoria (Lawrence and Bellette 2010). Subsequently, some of these vegetation communities extent is representative of original cover, whilst others have undergone significant land clearance in association with agriculture. Many, if not most of the forest estate is either re-growth following the Goldrush of the mid to late 1880s, or has been subject to a range of disturbances due to poor forestry practices, particularly (but not solely) in the past. Early forestry practices in Victoria included the removal of litter and fallen timber, removal of shrubby undergrowth including targeted removal of wattles (nitrogen fixing species), and removal of arboreal parasitic plants (Lawrence and Bellette 2010).

6.8 wildfire

The relatively flat plains of the WPNGW and the overall lack of forests and woodlands mean the area is at less risk of severe fires as are more forested areas of Melbourne's peri-urban fringe. However, the 2013 Epping / Wollert fire that burnt large areas of grassland on Melbourne's northern edge is an illustration that grasslands provide adequate fuels for uncontrolled and dangerous wildfire. Fire arson is identified as one of Australia's most costly crimes and is correlated directly with urban and rural township fringes. Peri-urban issues of 'poorer job opportunities and fewer transport options, particularly for people with low skills, and youth' are important factors that contribute to the increased occurrence of fire arson (Stanley et al. 2010). Under climate change scenarios, the wildfire risk will be increased, albeit not as significantly as inland areas of the Victoria. However, warmer summer weather will increase the dying of grasses allowing for increased levels of surface fuels. According to the Grassland Fire Danger Index (GFDI), a standard measure of climatic risk for grassland fires, there are currently 38.7 days each year in the Melbourne region when the GFDI rating is very high or extreme. This could increase by as much as '41.2–45.0 days by 2020 and 42.2–54.5 days by 2050' (Hennessy et al. 2006). The northern slopes of the Toolern Hills are subject to a Wildfire / Bushfire Management Overlay in recognition of the increased vulnerability of the forested areas to fire.

The State Government is committed to increasing the regular fuel reduction of forest and woodlands on public land to abate the threat state-wide threat of wildfire. Across large areas of public land this policy may mean repeated burning on roughly 20 year rotation in broad scale mosaic of fuel reduction burning. This type of burning regime is thought to be the optimal compromise between maintenance of biodiversity and reducing the overall fire threat. The increased burning regime is not without risk, and a number of fuel reduction fires have escaped containment lines and burnt as wildfire in recent years. The placement of housing and human and physical assets in landscapes adjoining or contiguous to the vegetation under fuel management will need to be considered carefully as a result.

On forest edges and around towns, forest fire fuel management focuses on "strategic breaks" and "asset protection" zones. The fuel removal activities and repeated burn regimes in these zones are largely non-compatible with maintaining many biodiversity values and provide increased opportunities for weed encroachment. Increasing residential housing along bushland boundaries necessitates a need for increased strategic breaks and asset protection zones within adjoining forest.

6.9 pest plants and animals

The management of pest plants and animals in the peri-urban interface is a difficult challenge. The greater western Melbourne area is notorious for unabated incursion of Weeds of National Significance, namely Serrated Tussock (*Nassella trichotoma*) and Chilean Needle-Grass (*Nassella neesiana*) and others. Largely unpalatable to stock these "stipoid" grasses from the Americas have outcompeted indigenous species where soil disturbance and inappropriate stock grazing regimes have occurred. Peri-urban grazing pressure has a propensity for hobby-interest including horses and goats kept in paddocks of limited size and capacity. Weeds non-selected by stock as fodder quickly establish themselves and replace native vegetation. The return of native vegetation is almost irreversible. Chilean Needle-Grass (*Nassella neesiana*) forms thick swards that exclude other species creating a grassy monoculture. Feral cats and foxes make prime use of the tall, wind proof grass habitat, for rest and hunting. The weeds also reduce the productivity of land for agriculture and significantly increase management costs. The study area is a key border between areas near Melbourne heavily infested with these species and the uplands where control strategies may impede the further spread.

As the population of an area increases, so too does the number of household gardens and exotic plants. Many highly invasive plant species are sold at commercial plant nurseries and these pose considerable threats to native bushland. Examples of common garden plants that are potentially destructive to local biodiversity include Gazania (*Gazania* sp.), Ivy (*Hedera* sp.), Freesia (*Freesia alba* x F. *leichtlinii*) and Gladiolus (Gladiolus tristis) (DSE 2009a). These species and others are often spread by the unlawful dumping of garden waste along roadsides or in bushland reserves.

Increased urban development also makes pest animal management particularly complex. Poison baiting and shooting are the most widespread control methods for species such as foxes, feral cats and rabbits, but these methods are inappropriate or deemed unsafe in peri-urban environments owing to interactions with, and close proximity to humans. Free roaming pets (dogs and cats) and feral cats are not only likely to disturb and kill wildlife, but may come into contact with poison baits laid for foxes. Pest animal populations also often increase exponentially at urban boundaries owing to a lack of effective management strategies and increased food resources (Saunders 2007; Saunders & McLeod 2007). This can lead to increased predation of livestock or destruction of crops for agricultural enterprises that persist on the urban fringe. Species such as the red fox are also a serious threat to native fauna and can pose considerable nuisance value to urban residents by preying on chickens and household pets, digging under infrastructure, and chewing irrigation equipment.

Species identified as serious weeds that must be controlled and not allowed to set seed by the City of Melton (identified as part of Council's Environmental Enhancement Policy) are:

- Serrated Tussock* (*Nasella trichotoma*)
- Artichoke Thistle* (*Cynara cardunculus*)
- Paterson's Curse* (*Echium plantagineum*)
- African Boxthorn* (*Lycium fercoissimum*)
- Prairie Ground Cherry* (*Physalis viscosa*)
- Chilean Needle Grass* (*Nassella neesiana*)

In addition to the species listed above, the following are also identified for control:

- Spiny Rush* (*Junctus acutus*)
- Hoary Cress* (*Cardaria draba*)
- Gorse* (*Ulex europaeus*)
- Bathurst Burr* (*Xathium spinosum*)
- Sweet Briar* (*Rosa rubiginosa*)
- Blackberry* (*Rubus fruticosus*)
- Horehound* (*Marrubium vulgare*)
- Galenia (*Galenia pubescens*)
- Prickly pear* (*Opuntia stricta*)
- African thistle (*Berkheya rigida*)
- Spear Thistle* (*Cirsium vulgare*)
- Wild Mignonette* (Reseda luteola)

6.10 land stability (salinity and erosion)

The removal of perennial native vegetation for agriculture reduces water uptake by deep rooted vegetation and can result in increased rainfall infiltration into the ground water system. This in turn, can lead to a rise in the water table, drawing salts closer to the ground surface and concentrating salts in the soil as water evaporates (ANZECC Taskforce on Salinity and Biodiversity 2001). Urban development can also impact significantly on salinization through various processes such as altering surface and sub-surface drainage patterns, exposing saline subsoils through earthworks and modifying the water cycle through potable water, stormwater and sewerage systems (Fallding et al. 2005). The impacts of dryland salinity include reduced agricultural productivity, salting of wetlands, loss of remnant vegetation and damage to aquatic fauna (ANZECC Taskforce on Salinity and Biodiversity 2001). Moreover, common impacts of salinity in urban environments include decreased water quality, waterlogging, increased failure of road infrastructure and decreased life span of some brick and concrete structures (Fallding et al. 2005). Within the WPNGW there are sections of salinity discharge along Kororoit Creek and Toolern Creek (PIRVic 2007)

Erosion is also an important consideration in the peri-urban interface as the conversion of land from rural to urban use modifies the ground surface and hydrological characteristics which can result in erosion and increasing sedimentation (Rowntree et al. 1991). The majority of the WPNGW is considered at low to moderate risk of erosion (from both wind and water), although much of the land north of Toolern Vale is regarded at high risk of water erosion, while sections of Kororoit Creek, Toolern Creek and Djerriwarrh Creek are regarded at high risk of tunnel erosion (PIRVic 2007). Careful management of erosion of these regions will be necessary to prevent sedimentation of waterways and subsequent issues further south in the more urbanised sections of the WPNGW.

6.11 climate change risks to biodiversity

There is no doubt that the climate change projections for the area present serious risks to biodiversity in the study area. All warm blooded fauna has a relatively narrow thermal envelope for survival, whilst the livelihood of plants and animals is regulated by temperature as a primary trigger. Whilst climate change scenarios presents the most serious challenge for biodiversity across Australia, it is noteworthy that the projections for the WPNGW are more moderate than for many other areas of Victoria (and Australia) suggesting that the area may offer refuge to species during widespread drought and hot weather expected with increased variability of the El Niño–Southern Oscillation. The provision of resources for wildlife in restored creeks, in farm dams (and the provision of habitat), and in waterways and streetscapes of adjacent urban areas should not be underestimated during drought and heatwave where these features can offer significant refuge.

Either planned or unplanned, fire will play an increasing role in native ecosystems of the WPNGW and be a major determinant of long term trends in species diversity and changes in composition. Incorporating fuel reduction burning close to urban housing is contentious and problematic for land managers. At the same time it is widely acknowledged that the creation of a landscape "fuel mosaic" through controlled burning reduces the threat and impact of wildfire both on human and ecological assets, whilst best providing for the habitat needs of a wide range of species. Effective planning for strategic breaks that delineate the threat of native vegetation and human assets (outside of conservation reserves) should be an important consideration.

6.12 opportunities for conservation

- Conservation investment incentives associated with urban expansion and associated policy instruments create and manage the incentive to offset the loss of native vegetation in the urban area through investments outside the urban landscape but within the VVP Bioregion. As current land reserved for conservation within the WPNGW is less than 3.7 percent, there is considerable merit to increasing the estate size. In an important study, Bennett and Radford (2004) found that in rural landscapes with less than five percent native vegetation cover, an intermediate restoration goal should be to achieve 10-15 percent cover to avoid local species extinctions, although 30–35 percent is required to maintain resilient fauna populations. As approximately 22% of the WPNGW currently under native vegetation cover is almost entirely within the Central Victorian Uplands bioregion, there is scope and incentive to increase the conservation estate in the Victorian Volcanic Plains. Complicating this issue is the current Government policy of designating specific areas to accommodate offsets, reducing the ability for these opportunities to be maximised within the study area.
- Increasing native tree cover adjacent to the Green Wedge in urban areas is likely to provide conservation benefits. For instance, in Canberra, the "bush capital" (Ikin et al. 2013) examined bird distribution patterns in suburbs and adjacent reserves of Canberra, finding that suburbs with ≥30% native (*Eucalyptus* spp.) street trees and the reserves adjacent to these suburbs had significantly higher bird species richness. It is therefore of benefit for the areas biodiversity, particularly the bird assemblage, that adjacent urban development seeks to maintain and establish native vegetation as part of the streetscape.
- Linear reservation of land along watercourses and flood plains within and outside the Urban Growth Boundary is occurring in areas surrounding the Green Wedge. Initiatives with high relevance to the WPNGW are generally in concept phase but include Parks Victoria's *Toolern Creek Park Plan* (Parks Victoria 2009) identified south of Melton, and the Arnolds Creek Biolink being progressed by the Melton Environment Group (2009), and the *Kororoit Creek Regional Strategy* (2006).The importance of protecting waterways and floodplains to maintaining the biodiversity of the Green Wedge has been implied throughout this document.

Revegetation and restoration opportunity along creek corridor

potential strategies for managing biodiversity

Outlined below are some potential areas where steps could be taken to increase the biodiversity value of the Green Wedge:

- Ensure the security of new and existing gazetted conservation reserves to safeguard against further urban expansion in the future and implement controls to protect these areas.
- In the vicinity of Long Forest: prevent further loss or modification of intact remnants of the Rocky Chenopod Open-scrub community; protect the existing stands of this community by limiting urbanisation on adjoining land and restoring degraded areas on private land.
- Advocate for increasing the area of conservation estate to at least 15% (ideally greater than 30%) by identifying and acquiring key areas of remnant vegetation on private land that are of high flora and fauna habitat value, support populations of significant species, and/or can be used to consolidate blocks that are reserved already.
- Seek to further protect large old trees and patches of native vegetation through the planning scheme and overlays.
- Seek to incorporate creek lines and floodplains as open space within the WPNGW, especially those that connect with existing Biolink projects, or link current areas of conservation estate.
- Provide open space in the Urban Growth Boundary with indigenous tree and shrub plantings to enhance the WPNGW biodiversity value.
- Continue to educate, enforce and encourage (rate rebate program) invasive species management through Council's Environmental Enhancement Policy in order to manage threats by foxes, cats, and invasive plants.

Vegetation along a creek corridor

6.13 key considerations and issues:

Some of the key implications and issues raised by an analysis of the existing environment include which should be considered in decision-making in the Green Wedge are:

- Predicted changes to rainfall and other weather patterns and the impact on both agricultural practice and flora and fauna.
- Urgency and importance of the protection and enhancement of threated plant communities.
- Protection of habitat along creek corridors and connective landscape elements given the importance of these areas for bird and other species.
- Mechanisms for achieving the required protection of listed plant communities which provides an incentive for landowners.
- Retention of remaining larger trees and other ‘natural breaks’ in the rural landscape.
- Lack of accurate or comprehensive records and mapping of flora and fauna.
- Importance of roadsides in accommodating remnant vegetation.
- Protection of key habitat areas for endangered species (i.e. creek corridors).
- Acknowledgement of role and impact of fire reduction practices and potential conflicts with retention of native vegetation.
- Continued management and reduction in pest plant and animal species.
- Role of adjoining urban areas in supporting biodiversity outcomes in the Green Wedge.

Protected area on Harkness Road

7 attributes: land use and activity

This section of the report will outline existing land uses, as well as other sites of activity or interest within the study area, with a particular focus on the use of the land for agriculture. It also addresses land uses adjoining the study area where these may impact on the area. The primary land uses within the WPNGW are agriculture, equine related activities and rural residential uses, although the land also provides opportunities for a number of other existing uses, below and on Figure 16: Land Use.

7.1 agricultural uses

The agricultural sector plays an important role within the City of Melton and across the economy, although it is not a large employer in the region (Melton City Council 2008). Food and fibre producers in the WPNGW have a competitive advantage over producers in many other regions of Victoria as the area's close proximity to Melbourne's markets and road networks greatly reduces transportation time and associated costs. However, the soil and the availability of water, as well as urban related pressures counter this, making traditional agricultural pursuits such as broadacre cropping and grazing difficult within the study area

While land capability is discussed further below, in general the southern half of the WPNGW (~ south of Diggers Rest-Coimadai Road) generally contains relatively deep and well-drained soil with low salinity and a temperate climate where spring frosts are limited and temperatures are largely mild. The land in this region is of reasonably high agricultural value as it is suited to a wide variety of commodities and therefore provides the greatest versatility to sustain multiple agricultural uses and adapt to changes in consumer demand and/or market conditions (PIRVic 2007). The areas north of Diggers Rest-Coimadai Road are of slightly less agricultural value owing to the moderately drained soils, lower annual temperature and the presence of steep slopes and stony ground which make cultivation less suitable (PIRVic 2007).

geology, topography and soils

The VVP Bioregion encompasses a flat to undulating topography with occasional dormant volcanoes forming higher mounts. This region occurs westward of Melbourne to almost the South Australian border (Cochrane et al. 1999). Across much of this landscape, numerous, usually thin (several metres thick) lava flows (basalt) have formed the dominant geological land surface. The prominent topographical features within the WPNGW include Mount Kororoit (297m above sea level), a small asymmetric conical hill considered of geological state significance (Rosengren 1994). Other mounts of high topographical relief and similar geological origin include Mount Tophet (~350m asl) and Sheoak Hill (~260m asl). The basalt flows of these topographical features along with volcanic hills of similar geological origin outside and north of the WPNGW define the drainage pattern of the Kororoit Creek. Along the creek and its floodplain a number of alluvial deposits, terraces, and boulder formations are considered of local geological significance (Land Design Parnership 2006). Sometimes overlaying the basalt along creek lines and in shallow swamps is Quaternary features of colluvial deposits and alluvial sediments.

The Melton Gilgai Woodlands Nature Conservation Reserve is one of the larger examples of this more recent geological feature. The basalt gives rise to soils dominated by red clay loam or a fine sandy soil layer over a medium to heavy clay. The soils are fertile and high in available phosphorus (Foreman & Walsh 1993). The degree of stoniness varies across the basalt landscape; shallower stonier/rockier soils occur on more recent lava flows while deeper soils with little stone occur on the shallow slopes of volcanoes. Some of the shallower soils (generally red or brown) are clay loams or gradational, some structured, others not. Dark (black or grey) cracking clay soils over basalt occur in depressions or wetter elevations where Quaternary deposits are present. Paler clay soils occur in drier depressions. Brown (yellowish) sodic or non-sodic texture contrast soils (loams over medium clays) occur on older sedimentary rock. Colluvium derived from these sediments has developed yellow sodic texture contrast soils (sandy loam over medium to heavy clay) which are potentially erodible. Minor occurrences of sandy soils occur on alluvium particularly small narrow terraces. Saline soils occur in the lower drainage lines (drier climate)

To the north and north-west of Toolern Vale considerably older Ordovician marine sedimentary deposits of sandstone, shale, and mudstone have been uplifted and dissected forming the landscape of the Lerderderg, and Yangardook (i.e. Black Hills) areas. This geology has strikingly more relief when compared to the flat volcanic plains and forms part of the Central Victorian Uplands Bioregion. Typical of the bioregion the bedrock is dissected and uplifted, giving rise to valleys and plains of fertile alluvial soils forming corridors between more steeply sloped peaks and ridges. The soils of these hills are typically of poor to very poor fertility.

There are numerous hills along the ridges, some of which are named and many that are not. The far north-west corner of the Green Wedge is a plateau of higher relief that links the Lerderderg region and Black Hills. Gilby Hill (~420m asl) between Blackhill Road and Burns Lane forms the eastern most flank. The Black Hills runs north to south, between Green Hill in the north (~490 m), the highest point in the study area, to a topographical complex finish of knolls, ridges and gullies known as Flagstaff Hill (365m asl) located just north of Melton.

To the west of the Black Hills the western boundary of the study area follows the Djerriwarrh Creek forming a steep gully between the hills to the Djerriwarrh Reservoir and further downstream. The creek vaguely follows the north-south running Djerriwarrh Fault. Running roughly east–west in alignment with the Diggers Rest-Coimadai Road is the Coimadai Fault. This fault is a hidden but significant feature as it defines the southern extent of the Lerderderg and Black Hills "high ground". South of the Coimadai Fault the hills give way to a landscape of gentle slopes and plains of the Victorian Volcanic Plains. An exception to this follows the western boundary of the Green Wedge along the Djerriwarrh Creek back dropped to the west by the more low hills of the area known as Long Forest Flora and Fauna Reserve (mostly but not entirely outside of the Green Wedge). Miocene sediments form these low hills and a thin strip of land to the east of the Djerriwarrh Creek.

Equine related agricultural activity

Views to the hills from Toolern Vale

land capability

An understanding of the capability of the land in the study area to accommodate agriculture is important in determining the degree to which on-going agricultural practice remains a possibility and should therefore be protected. A land capability map has been prepared based on the information above and classified on the basis of landform and soil type differences described above. The differentiation of soil types within the WPNGW area is as follows:

- Melton red soils (Red calcareous silty clay loams);
- Kororoit grey clays (Grey cracking clays);
- Toolern Creek alluvial deposits;
- Toolern Vale Hills (Ordovician deposits).

This section of the report details the natural feature classification used and a descriptive analysis of the four land capability classes found within the Study Area.

Class Name	Preferred Farming System	Agricultural capability
Melton Red Soils	Broadacre Cropping	2-3
Mt Cottrell Rises	Grazing	3-4
Kororoit Grey Clays	Broadacre Cropping/Grazing	3
Toolern Vale Alluvial Deposits	Broadacre Cropping/Grazing	2-3
Toolern Vale Hills	Grazing/Forestry	3-5

Table 5: land class and agricultural capability

A summary of the five classes, their preferred farming system and agricultural quality ranking is presented in Table 5 below and shown spatially on Figure 15: Land Capability with a more detailed description of the characteristics following. The table below brings together a range of factors which influence the capability of land to support agricultural uses and summarises them. The different land capability classes are compared on an environmental feature basis where a 5-point scale is applied, 1 has the highest capability and 5 has the least agricultural capability. A more detailed description of those areas is provided below.

Criteria and Performance Levels to Measure Agricultural Land Quality

Feature	1 Very High	2 High	3 Average	4 Poor	5 Very poor
Length of growing season (months)	11 – 12	9 – 11	8 – 9	7 – 8	< 7
Availability of supplementary water	Yes	Yes	No	No	No
Slope %	0 – 5	3 – 6	6 – 12	12 – 20	20 – 30
Drainage	Good	Moderate - easily drained	Moderate - not easily drained	Poor	Very poor
Soil	Friable loams	Friable loams	Clay Loams	Sands & clay	Sands & clay
Profile permeability	High	Moderate	Mod/low	Low	Low
Depth of friable soil	50 cm	20 - 30cm	10 - 25cm	5-10cm	< 5 cm
Soil fertility	High	Mod/high	Moderate	Low	Low
Depth to rock	1 m	1 - 0.5 m	0.5 m	0.5-0.1m	< 0.1 m
Erosion	Low	Low	Moderate	High	Very high
Flooding frequency (years)	None	1 in 15	1 in 10	Annual	Annual
Arability	Excellent	Good	Moderate	Poor	Nil

Table 6: agricultural performance

Melton Red Soils: Farming systems are based on broadacre crop production, generally cereals, particularly barley. Crop rotation is 3-5 years of seasonal cropping with 3-4 year ley phase, preferably pasture livestock enterprise principally merino wool production, but some prime lamb and cattle. Expected crop yields (cereals) 2.5 t/ha, livestock stocking rates of between 6.0 – 7.5 dry sheep equivalent per hectare. Land quality 2-3. As such the optimal agricultural uses for these soils is an alteration of broadacre cereal cropping and livestock enterprise.

Melton Red Soils

Length of growing season	Rainfall 450 – 550 mm pa growing season Apr-Nov but strong seasonal variability.
Landscape profile	Gently undulating plain.
Slope	0 - 5°
Drainage	Shallow surface drainage lines leading to major creeks.
Soil Profile	Basalt derived, duplex, red-brown silty clay loams overlying a heavy clay, some surface stone and boulders throughout the profile. Natural fertility high.
Permeability	Low
Hazards	Dust, sheet erosion under excessive cropping.
Land Use	Broadacre crop production, generally cereals, particularly barley. Crop rotation 3-5 years seasonal cropping with 3-4 year ley phase, preferably pasture livestock enterprise principally merino wool production, but some prime lamb and cattle. Expected crop yields (cereals) 2.5 t/ha, livestock stocking rates of between 6.0 – 7.5 dry sheep equivalent[5] per hectare.
Land quality	2 – 3

Recycled water pipeline

Vineyards near the Toolern Vale Hills

Broadacre farming in the southern part of the study area

Kororoit Grey Clays: This is the largest land class in the study area. Farming systems are broadacre cropping based, but requires suitable seasonal conditions and good timing of operations to achieve satisfactory yields. However, grazing (pastures) is the dominant use because of small farm size, urban intrusion and difficult farming conditions because of soil type characteristics. Land quality 3.

Kororoit grey clays

Length of growing season	Rainfall 500-600 mm pa, growing season Apr – Nov but considerable seasonal variability.
Landscape profile	Gently undulating plain, rising to the north, with occasional hillocks.
Slope	5 - 15°
Drainage	Well defined drainage lines: catchment of the Kororoit & Emu Creeks.
Soil Profile	Basalt soils, uniform profile, heavy dark grey clay loams, overlying heavy textures, expansive clay. Some stone cover, and basalt floaters throughout the profile.
Permeability	Low.
Fertility	High.
Hazards	Drought, weed and pest (crickets).
Land Use	Some broadacre cropping, but requires suitable seasonal conditions and good timing of operations to achieve satisfactory yields. Grazing (pastures) dominant use. Region less affected by urban intrusion.
Land quality	3

Toolern Vale Alluvial Deposits: Land quality 2-3 and natural resource base suited to broadacre cropping and associated livestock activities. However, holding sizes are small, urban intrusion significant (small lot size) and grazing the more common use. More intensive culture is limited by rainfall patterns and the lack of irrigation.

Toolern Creek Alluvial Deposits

Length of growing season	Rainfall 500-550 mm pa, growing season commences in April & continues through to November.
Landscape profile	Gently undulating sloping terrain.
Slope	0 - 5°
Drainage	Surface drainage to Toolern Creek.
Soil Profile	Red-brown-grey silty clay loams, overlying a heavier clay loam. Deep, stable & suited to cropping as well as pasture.
Permeability	Moderate.
Fertility	Moderate-High
Hazards	
Land Use	Broadacre cropping where holding size permits. Grazing more common. More intensive culture limited by the lack of rainfall/irrigation water.
Land quality	2 - 3

Toolern Vale Hills: This land class comprise undulating lower slopes rising to steeply sloping, rocky, open forested hills. On lower slopes soils are grey brown silty clay loams overlying a grey brown to yellow medium textured clay. They can support grazing enterprises when sown to improved pastures.

Toolern Vale Hills

Length of growing season	Rainfall 550-700 mm pa, depending on elevation. Growing season 7-8 months depending on season.
Landscape profile	Undulating lower slopes rising to steeply sloping, rocky, open forested hills.
Slope	10 - 30°
Drainage	Well defined gully lines.
Soil Profile	Grey brown silty clay loams overlying a grey brown to yellow medium textured clay. Soils very shallow on upper slopes, with silt, slate and sandstone exposed throughout the profile.
Permeability	Moderate.
Fertility	Moderate-Low
Hazards	Gully and sheet erosion.
Land Use	On lower slopes, improved pastures supporting grazing enterprises. Upper slopes limited to open forest.
Land quality	3-5

On the upper slopes soils very shallow with silt, slate and sandstone exposed throughout the profile. Land use is limited to open forest.

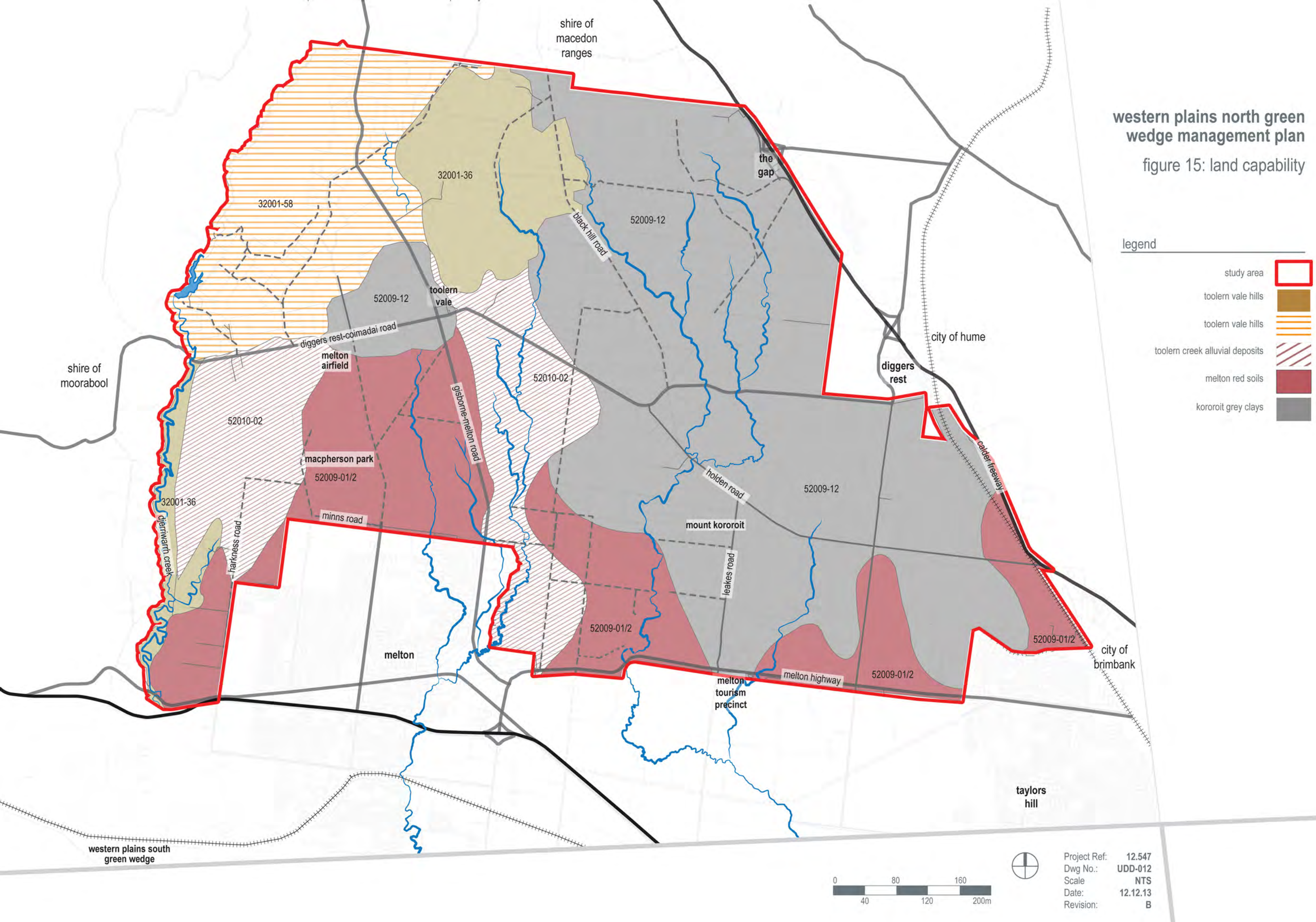
Area around Kororoit Creek

More intensive agricultural production in central study area

Toolern Vale Hills

western plains north green wedge management plan

figure 15: land capability



legend

- study area
- toolern vale hills
- toolern vale hills
- toolern creek alluvial deposits
- melton red soils
- kororoit grey clays

0 80 160
40 120 200m

Project Ref:	12.547
Dwg No.:	UDD-012
Scale	NTS
Date:	12.12.13
Revision:	B

farming practices

With the exception of the Toolern Vale Hills, the most sustainable farming system is broadacre cropping and associated livestock activities, both wool production and prime lamb production. The climate and soils will generally support this type of use.

However, the allotment and tenement pattern largely prevent this type of use. Broadacre crop production yields relatively low economic returns on a per hectare basis (gross margins of between $250-$400/ha) and therefore require large areas to be available to be able to justify machinery investment and labour input. Only a few commercial farmers remain in the district to practice broadacre crop production either through owning their own land or being prepared to lease or sharefarm other holdings. Because of these constraints, most land owners become grazing based and not dependent on agriculture as a prime source of income.

An analysis of agricultural outputs in the western green wedges, documented in the Port Philip and Westernport Catchment Management Authority (PPWCMA) report *Square Pegs in Green Wedges*, identified that the value of agricultural output was significantly less in these western areas than other green wedges. Importantly, much of this value was also associated with the more southern parts of the western green wedges where more intensive animal and vegetable production is occurring and there are much larger lot sizes. There is also a significant lack of diversity within agricultural practise in the area, which may indicate a lack of investment into research for new markets within the agricultural areas. This would be consistent with findings regarding the level of land speculation that is occurring in the area, discussed later in this section. There is some small evidence of isolated examples of newer markets being explored, such as an olive grove within the study area.

The Sunbury-Melton recycled water pipeline provides some opportunity for intensive agriculture. Approximately 2200ML of Class B recycled water is available vineyards, olive groves, plant nurseries, golf courses, council reserves and municipal uses. The level of water demand for actively transpiring green crops might require up to 6ML/ha for optimal performance. However, most crops will have an irrigation demand less than this. Wine grapes for example, are often deliberately stressed with an expected irrigation requirement of 2ML/ha. Fruit trees and irrigated lucerne will be considerably higher. It is noted that the amount of recycled water available may increase dependant on demand and that current consideration is being given to the provision of Class A recycled water to the study area which would increase the range of agricultural types able to utilise this resource.

7.2 lot sizes

Figure 17: Lot sizes identifies the prevailing pattern of lot sizes in the study area. Where there has been some fragmentation it has occurred in the areas around the fringes of the Melton Township and in the forested areas where rural residential land uses are predominate.

The 20ha minimum lot size which affects much of the study area was brought in as a divisor to determine the number of lots that an independent landholding could yield. The yield could then be clustered on a 1-5ha basis with the residual as the balance, the idea being that it would continue under commercial agriculture while the small lots formed a rural residential cluster. Some of the weaknesses of the policy appear to be:

- It results in rural residential development being ad-hoc, dispersed and hard to effectively service;
- A series of clusters across rural land has the potential to cause more land management problems to surrounding commercial farmers than if rural residential development is concentrated in one area;
- The residual block is not necessarily of the optimum size to ensure the engagement of commercial agriculture. There are examples within the study area which are being poorly managed;
- The 20ha minimum has no clear rational as the divisor to the yield calculation and its ability to promote good land management practices is questionable.

Part time farming is potentially the most significant form of land use in the municipality to enable the continuation of commercial farm activity as it can be practised by remaining (retiring) commercial farmers and new entrants to agriculture. It generally falls in the range of 30ha-100ha. Below 10ha landholdings tend to be rural living residences rather than any farming activity while those in between (10-30ha) become confused between commercial agriculture and rural living. Holding size for part time farming needs to be of sufficient size to allow essential farm practises such as crop rotation, rotational grazing, weed and pest control etc to be conducted in an efficient and sustainable manner. Ideally, to allow this to happen requires 40ha or more but a lesser size may be appropriate depending on the agricultural pursuit. Determining the minimum holding size for effective part time farming will vary across the municipality depending on land capability but generally the following criteria need to be fulfilled:

- The farming activity that is intrinsically suited to the property's natural features needs to be of a sufficient scale to allow sustainable farm practises to be conducted under commercial conditions, and provide a level of output sufficient to justify the investment in essential farm improvements and structural facilities;
- The natural features that affect a property's level of productivity, such as area and quality of soils, water catchment and drainage patterns, contour, erosion susceptibility and flooding patterns, need to be capable of adequate management within the property's boundaries.

Informal horse paddocks in the Toolern Vale Hills

7.3 equine and other animal related land uses

The equine industry (horse studs and racing) is also particularly important throughout the region and within the study area. This is clearly illustrated on Figure 16: land use plan. Equine uses are distributed throughout the study area with particular concentration to the east. However, one of the larger operation (Emirates) is located closer to Diggers Rest, continuing the established trend for the location of these uses along the Diggers Rest – Coimadai Road.

Thoroughbred (racing) and Standard-bred (trotting) enterprises are strongly represented within the district and can be run intensively through the purchase of feed (i.e. not growing feedstock on the property). Some of the larger operators are significant within the Victorian industry, sufficient for the location to be promoted as a strategic core of these types of equine uses. It is noted though that most current industry participants are located on small holdings where their activities might be considered interest based rather than commercial operations.

However, more broadly within the Green Wedge, most small holdings are directed to cattle or sheep production. The returns per hectare are low (gross margins between $100-$200/ha) due to low stocking rates (5-10 dry sheep / ha) and moderate to low livestock performance due to management practices employed. It is also noted that there has been an anecdotal increase in the amount of cattle stocked within the area in recent years. This grazing activity is generally not commercially based as it is used as a 'holding' use or to support rural living activity.

A number of other animal related uses are also present within the study area, most commonly catteries and kennels but also breeding sites and some intensive animal production was previously located close to MacPersons Reserve.

Emirates Park

7.4 rural residential

Throughout the study area, many of the lots appear to be used primarily for residential purposes. Existing rural residential lots tend to be clustered in the northern and western parts of the study area. Lots used for this purpose range in size from historic small lot subdivisions to many much larger lots in the treed areas to the north. While some 'hobby farm' type uses may be occurring on this land, predominate use of the land is for residential purposes.

Many of the lots which may be nominated as accommodating grazing activities are also likely to be facilitating only nominal grazing activities, which are ancillary to this rural living lifestyle. Similarly many of the smaller scale equine activities may well be non-commercial in use and associated with these rural residential uses. The *Square Pegs in Green Wedges* report found that the western wedges had a significantly lower amount of rural residential land available. This may be taken up by the smaller lot excisions allowed under the current schedule to the Melton Green Wedge Zone. There is anecdotal evidence of strong demand within the Melton context for rural residential properties.

There have been a range of decisions made in relation to permit for further development of rural residential uses within the study area (and the associated subdivision to support such uses). Council has generally held a relatively consistent position, in line with the requirements of the zone and this has been supported by the Victorian Civil and Administrative Tribunal. Where there have been examples of development of rural residential these are likely to have been supported by Council, and usually against the planning officer's recommendations.

7.5 natural land uses

There are a number of important conservation areas within the study area, which are addressed in more detail at section 6.6. These include:

- State Parks and Flora and Fauna Reserves managed by Parks Victoria, including the Lerderderg State Park, the Long Forest Flora and Forest Reserve.
- Other conservation reserves managed by Council and / or community groups (although these may be Crown land) including the Harkness Road woodland, the Kororoit Creek Streamside Reserve.
- There is also a proposed flora and fauna reserve in the far south-east corner of the study area.
- In addition, there are a number of other areas of land, which are set aside for a range of uses but retain a natural land use within the study area, identified on the following plan (Figure 16: Land Use and Activity). Some of these areas may be used for forestry also

7.6 recreational uses

The study area's recreational uses can be separated into two categories. Active recreation is generally an organised sporting event with teams and umpires, for example a football or cricket match etc. In contrast, passive recreation is non-consumptive and includes activities like walking, cycling and wildlife observation.

active recreation

Active recreation within the study area is centred in the MacPherson Park Regional Sporting Complex, which caters for Australian Rules Football, baseball, cricket, cycling, soccer, tennis and rugby. The reserve is located in the north-west part of the study area along Coburns Road between Minns Road and Diggers Rest-Coimadai Road and is somewhat disconnected from the Melton township.

In addition to the more traditional recreational uses outlined above, MacPherson Park Regional Sporting Complex also provides a range of other local community organisations facilities and clubrooms associated with pigeon breeding or racing and V8 jetboats. The Park was originally planned as a 'regional recreation area' intended to be used by adjoining municipalities in addition to the residents of Melton. However, this did not eventuate and with the development of additional sporting and recreation areas in new growth areas, the connectivity issues between this Reserve and the urban areas of Melton will need to be considered.

There are also a range of Equestrian parks and facilities within the study are which provide opportunity for horse riding and training, and facilities associated with dressage and show jumping. Located within this areas are the Melton Equestrian Park and the Greyhound Racing Club. These two activities, particularly the latter, are another key area where there WPNGW supports recreation uses, although this has occurred primarily on private land to date.

passive recreation

The study area provides for a range passive recreation uses, including along the Toolern Creek, where land has not yet been developed with trails, seats etc but where land is set aside for this purpose. The Long Forest Conservation Reserve provides for bush walking (outside the study area on the western banks of the Djerriwarrh Creek) and wildlife observation. The Djerriwarrh Creek picnic area provides opportunity for bush walking, relaxation and wildlife observation and is accessed from the Western Freeway in the south west corner of the study area.

In addition, a significant strategy for the Kororoit Creek (the *Kororoit Creek Regional Strategy 2005-2030).* This includes environmental measures but also identifies a proposed linear trail running from the Melton Highway along the Kororoit Creek to Diggers Rest. This would connect to a broader trail network all the way to Altona and Port Phillip Bay.

7.7 other land uses

There are a number of other land uses which are present within the area, including:

- Land used for utilities including the Sydenham Terminal Station site in the south-east and land associated with the reservoirs and water treatment to the north-west of the study area.
- There are also two large quarries located within the study area, which are discussed further at section 9.
- To the south-west, adjoining the urban areas of Melton a large parcel has been set aside for to establish a future regional cemetery.
- There are also a scattering of churches within the areas, many of which are hard to distinguish from residential properties, but the most notable of which being the Jehovah's Witnesses' Assembly Hall located close to MacPherson Park.
- The Melton Airfield is within the study area, off the Gisbourne-Melton Road, although it is understood that this offers only joy flights and some pilot training at present.
- There are also a number of uses where the storage uses within the study area which could be considered semi-industrial including large quantities of soils, or car bodies etc are occurring on the land. Whilst some of these uses have been established in accordance with the Scheme, there are a number of uses that are unauthorised.
- Land has also been identified within the study area to accommodate rail stabling close to the alignment of the Calder Freeway (see discussion on Amendment C125, section 3).

Rural residential development

MacPherson Reserve sporting complex

residential hamlets

Within the study area there are also a number of clusters of residential development on lots smaller than would generally be expected in rural areas. Some were the result of historic small lot subdivisions permitted prior to the current zoning controls, however, some are the result of decision making by the Council. Within the study area, there pockets of small lot residential development near MacPherson Park, and two pockets to the north and south of the Diggers Rest-Coimadai Road close to the Djerriwarrh Creek. For the purposes of this assessment Toolern Vale is also identified as a residential hamlet, despite being outside the study area.

The Gap settlement in the north-east corner of the study area was originally an 1850 gold route settlement, and represents an anomaly within the study area (being a residential style subdivision within the Green Wedge), but is a relatively contained area, with an established development pattern.

7.8 other activities

A number of tourism related uses or sites have also been identified on the following figure (Figure 16: Land Use and Activity). However, there is not a significant amount of tourism activity in the area at present and those that exist are not necessarily highly developed. These include.

- The Harry Houdini monument on Holden Road celebrating the first motorised flight.
- An established picnic site off the old Western Freeway at the junction with the Djerriwarrh Creek.
- The Dingo Discovery Centre in the north of the study area
- Cellar door sales associated with a winery on Holden Road.
- Joyride flights which are available from the Melton Airfield.

It is also notable that one of the key tourism sites within the City of Melton (the Melton Tourism precinct) is located immediately adjoining the WPNGW south of the Melton Highway. This precinct contains a number of wineries and associated restaurant and reception centres. This proximity offers both opportunities to consider further rural related tourism within this area but the bulkier urban form of many of the buildings associated with this complex has the potential to compromise the Green Wedge area if not appropriately sited and designed. There have also been some recent VCAT decisions regarding tourism uses in the area which have found that, while the underlying zone identifies tourism as a suitable use, the particular characteristics of development proposal can still mean this is not supported. Most notably, as recent proposal for a farmers market in proximity to Leakes Road was refused by the Tribunal.

7.9 current land use pressures

Around the fringes of the urban areas there are existing telecommunication towers and it is expected as growth areas develop there will be a need for further infrastructure. Given the overarching need for this infrastructure to service new communities, it is expected that pressure for these uses will increase in the future as the areas develop and other companies seek to maximise their coverage. It will be important to consider any potential policy directions that may be needed in regard to the appropriate siting of such infrastructure

It is also noted that there are a number of churches (places of assembly) that have already established within the Green Wedge area. It can be anticipated that as the residential population grows, churches, which often find it difficult to acquire suitable urban land, will seek to establish within the green wedge areas.

There is also anecdotal evidence of schools also seeking to establish campuses within the green wedge areas proximate to the Urban Growth Boundary. Again, schools often require large tracts of land, which can be expensive and difficult to acquire within urban growth areas, particularly if land is not set aside during a structure planning process (for example, for private schools). As with churches, this pressure is likely to increase over time.

The dumping of waste and rubbish within the study area is also placing pressure on the area. While there is no official land fill area within the WPNGW, the dumping of rubbish (such as couches, garbage etc) occurs throughout. There have been a few approvals for legal fill sites to accommodate soil from construction activity but there is also a significant amount of dumping of illegal fill. This is a serious issue within the study area and is expected to continue to increase with the development of further residential estates in proximity to the Green Wedge.

There is also a significant amount of land speculation occurring within the precinct. The PPWCMA report on green wedges (*Square Pegs in Green Wedges*) identified that within Melbourne's western green wedges, this was likely to be the major reason for owning land within the area. This has very significant implications for achieving a sustainable land management regime within the area given that maintenance of the land could be seen as contrary to the aims of such speculation.

Dry stone walls are one of the more prominent heritage elements in the green wedge

Illegal dumping is occurring within the study area

7.10 key considerations and issues:

Some of the key implications and issues raised by an analysis of the existing land uses include which should be considered in decision-making in the Green Wedge are:

- An apparent mismatch between the soil capability and associated agricultural opportunities, and the lot sizes within the study area.
- The impact of land speculation on agricultural or other rural related opportunities.
- Opportunities associated with the recycled water pipeline, including potential provision of Class A water.
- Consideration of other agricultural production which may be more suited to the smaller lot patterns and require changes to default current policy position.
- Impact of dispersed rural residential uses on agriculture.
- Importance of equine related uses to the Green Wedge.
- Barriers that may exist to the development of existing land identified for rural residential purposes and / or the need for additional areas to be identified where this use may be supported.
- How to increase the amount of suitable tourism uses occurring within the precinct given the limited activity to date, including consideration of environmental and heritage assets, such as the existing dry stone driving route.
- Need for clear policy direction regarding urban related uses to manage pressures.
- Issues around enforcement of illegal practices such as dumping of rubbish and illegal fill.

western plains north green wedge management plan

figure 16: land use

shire of macedon ranges

shire of moorabool

city of hume

city of brimbank

melton

taylors hill

western plains south green wedge

historic djerriwarrh bridge 1
assembly hall of jehovah's witness 2
dry lake 3
harry houdini monument 4
kororoit creek streamside reserve 5
dingo discovery centre 6

the gap
toolern vale
diggers rest
melton airfield
macpherson park
mount kororoit
melton tourism precinct

black hill road
diggers rest-coimadai road
gisborne-melton road
holden road
calder freeway
minns road
djerriwarrh creek
harkness road
leakes road
melton highway

legend

- study area
- rural residential
- horticulture and nurserys
- parklands
- conservation reserves
- cropping and grazing
- equine industry
- intensive animal production
- quarries
- utility area / other
- church
- proposed cemetery
- proposed outer metropolitan ring road
- dry stone wall driving trail
- planning applications
- urban interface
- animal related uses
- hamlet developments
- tourism points

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western plains north green wedge management plan

figure 17: lot sizes (in green wedge and rural conservation zones)

legend

- study area
- lots under .4ha
- lots between .4ha and 1ha
- lots between 1ha and 4ha
- lots between 4ha and 10ha
- lots between 10ha and 40ha
- lots over 40ha

shire of macedon ranges

shire of moorabool

city of hume

city of brimbank

melton

taylors hill

western plains south green wedge

the gap

black hill road

toolern vale

diggers rest-coimadai road

melton airfield

gisborne-melton road

diggers rest

calder freeway

holden road

macpherson park

minns road

djerriwarrh creek

harkness road

mount kororoit

leakes road

melton tourism precinct

melton highway

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8 attributes: infrastructure and resources

This section identifies the key infrastructure and known resources located within the study area. These range from resources associated with quarrying activity to key pipelines and road alignments, all of which must inform the future management plan. The matters discussed below are also shown on Figure 18: Infrastructure and Resources.

8.1 quarries and extractive industry

'Hanson Diggers and Quarry' are located at Sheoak Hill central in the study area and produce aggregates, including crushed rock, sand, gravel, crusher dust and road base and a premixed concrete range. This operation is anticipated to remove the extent of Sheoak Hill into the future Metro Quarries and Laboratory is a relatively large quarry located to the immediate north of the Melton Highway (although access is via Leakes Road). It is understood that there is potential for this more southerly operation to expand. As with the other quarry within the study area, it predominately produces supplies for landscape and building purposes. Quarries within the area are subject to a range of conditions and requirements under the Department of Primary Industry, primarily around protection of environmental or residential amenity values.

In addition to the two existing quarries, a large proportion of the central section of the study area is identified as an 'extractive industry interest area', indicating that there may be potential for future quarry sites. This identification does not mean that the area will definitely be used for quarrying activity, or even that there are resources but represent a 'best fit' guess for where such resources may be located.

8.2 pipelines

There are two major pipelines which run through the study area. Perhaps the most significant of these is the recycled water pipeline which runs from the Sunbury Recycled Water Plant into the study area. It extends in two directions, east / west from Diggers Rest towards Toolern Vale and south / west along the alignments of Plumpton Road, Holden Road, Leakes Road and the Melton Highway towards the Melton Golf Course. This pipeline provide Class B recycled water and is suitable for agricultural and viticultural uses as well as recreation reserves and other public spaces.

In addition to this main pipeline, there is also another main water pipeline which runs from the Merrimu Reservoir via the Merrimu Filtration Plant in the west of the study area, to the Melbourne Water tanks at the north-west of Melton's urban areas

8.3 public utilities

In addition to the abovementioned Water Filtration plant there are a number of other public utilities in the area, including the Djerriwarrh Reservoir in the north-east corner. The remainder of public utilities tend to be clustered around the edges of the urban areas and include:

- The Sydenham Terminal Station and associated transmission line easements in the south east corner;
- A high pressure gas line in the far east of the study area
- An elevated water tank in the same location adjacent to Hillside;
- The above mentioned Melbourne Water tanks (which are technically just outside the study area); and
- At least two telecommunication towers along the northern urban edge of Melton at Minns Road.
- A radio transmission tower located on Mount Kororoit

8.4 rail infrastructure

A rail corridor runs along the eastern boundary adjoining the Calder Freeway. The only station in proximity to the study area is the station at Diggers Rest, however, a large area within the Green Wedge has been recently approved for development to accommodate train stabling. This was undertaken through Amendment C125 (6 December 2012) which includes an Incorporated Document which identified that development in this area was not subject to any of the existing controls under the Melton Planning Scheme, including the objectives and requirements of the Green Wedge Zone (refer Figure 17).

8.5 airports / airfield

The Melton Airfield is located along the Melton-Gisborne Road and provides opportunities for pilot training and for joy flights. The airfield has a small grass airstrip which runs approximately east-west. It has four hangars and parking for light aircraft, as well as an associated office.

The study area also forms part of the environs of the Melbourne's Tullamarine Airport and this is reflected through overlay controls. The affected area is located in the south-west and essentially corresponds to the non-urban between the suburb of Hillside and the township of Diggers Rest (which is directly related to the overlay controls which restrict development). It is worth noting also that there is a potential future alignment of a runway which has been identified which may increase the area affected by overlay controls if constructed.

8.6 roads

The road network within any study area is obviously a key part of any infrastructure assessment and the existence of roads is often an influencing factor in relation to where particular land uses chose to establish.

The study area is bounded by two major roads, being the Melton Highway and the Calder Freeway. While the Melton Highway has seen some reduction in its role given the upgrades to the Western Freeway further to the south, the road remains an important conduit to this freeway, and by extension, to the western areas of the state including major centres such as Ballarat. The Calder Freeway provides the key northern road link in the state, linking up with the CityLink tollway to provide access to the CBD for important regional settlements such as Castlemaine, as well as major centres such as Bendigo.

The two main roads which cut through the study area and connect it to the broader road network are the Melton-Gisborne Road and the Diggers Rest-Coimadai Road. The connections these two roads provide are self-explanatory. There are also other sealed roads within the study area which provide important local connections, among them:

- Leakes Road
- Holden Road
- Black Hill Road
- Coburns Road
- Plumpton Road

Leakes Road, in particular, will play a greater role in the future as the growth areas to the south develop, providing an additional access point to the Western Freeway. The remainder of local roads within the study area are unsealed. The more important among them in terms of connections through the areas include Harkness and Minns Roads, which form the western and northern boundaries of the Melton township and which are likely to be upgraded to sealed roads over time.

Another key consideration in relation to the road infrastructure of the study area is the identification of the proposed Outer Metropolitan Ring Road through the south east corner of the study area. The alignment of this road is clearly identified through the presence of a Public Acquisition Overlay and is likely to have very significant impacts on the future of this area when constructed.

Vic Roads see this road as *"being planned to accommodate a 100 kilometre long high-speed transport link for people and freight in Melbourne's north and west, creating the opportunity for new road and rail transport links through the Werribee, Melton, Tullamarine, Craigieburn / Mickleham and Epping / Thomastown areas to be provided as transport demand warrants".*

Construction of the road is unlikely to commence before 2020, and an assessment of the Environmental Effects of this project will need to be undertaken prior to the alignment being finalised, however, it is an important consideration in assessing longer term land uses and management practices which may be established in Green Wedge in the intervening years.

8.7 key considerations and issues:

Some of the key implications and issues raised by an analysis of the existing land uses include which should be considered in decision-making in the Green Wedge are:

- The need to manage and respond to existing resource extraction, given the purpose of the Green Wedge Zone.
- The presence of water and other pipelines within the study area.
- The implications of the future construction of both the Outer Metropolitan Ring Road and the Calder train stabling on adjoining land uses.
- Needs of larger regional infrastructure projects and how new projects could maximise beneficial outcomes for the Green Wedge.
- Pressures and opportunities associated with key road infrastructure.

western plains north green wedge management plan

figure18: infrastructure and resources

legend

- study area
- extractive industry interest areas
- quarries
- utility areas
- water supply catchment
- indicative 1km buffer around recycled water pipeline
- recycled water pipeline
- underground pipeline
- water tanks
- reservoirs
- transmission line
- transmission tower
- melbourne airport environs overlay
- train stabling
- proposed outer metropolitan ring road
- highways and freeways
- major roads
- minor roads
- unsealed roads
- train line

shire of macedon ranges
the gap
black hill road
toolern vale
city of hume
diggers rest-coimadai road
melton airfield
hanson diggers rest quarry
diggers rest
shire of moorabool
gisborne-melton road
calder freeway
macpherson park
holden road
mount kororoit
minns road
telstra tower
telstra tower
harkness road
leakes road
sp ausnet keilor terminal station
metro quarries and laboratory
melton highway
city of brimbank
melton
taylors hill

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9 attributes: heritage

9.1 post settlement heritage

The study area has a range of post settlement heritage features including homesteads, stone / blue stone cottages, outbuildings, dams, bridges, parks, farming stations and dry stone walls.

These heritage features are an integral part of the study area as they connect residents and visitors to the municipality's post settlement agricultural and grazing past and provide an insight into how life once was. The heritage features assist in creating a historical sense of place for the community and provide key landmarks with the Western Plains Green Wedge. The historical value and importance of these heritage features are protected by the various Schedules to the Heritage Overlay.

registered historical sites

A search of heritage databases established that known historical cultural heritage in the study area comprises archaeological remains and extant structures. A total of 68 historical sites occur in the study area which are shown on Figure 19 on the following page. These are:

- 20 historical sites recorded on the Heritage Inventory. Historical sites on the Heritage Inventory predominately occur as the archaeological remains of former settlements (farm complexes, hotels). Four of the sites on the Heritage Inventory are D listed (D7822-0124, D7822-0130, D7822-0223 and D7822-0838) and are considered to have negligible archaeological significance;
- 50 historical sites recorded on the Heritage Overlay. The majority of these are rural homesteads/dwellings and associated pastoral and agricultural infrastructure relating to the early settlement of the region;
- One historical site, a former army radio station, listed on the Victorian War Heritage Inventory.
- In addition, the components of 96 dry stone walls that appear to be associated with 18 historical sites listed on the Heritage Overlay occur within the study area.

scope and limitations of previous assessments

Several broader scale historical heritage assessments have encompassed the entire WPNGW area. These have focused on identifying both built structures and archaeological sites. A number of small scale historical archaeological field assessments, restricted to surface inspections, have been undertaken to inform proposed developments. No historical archaeological subsurface testing or excavation has been undertaken in the WPNGW area.

As a result of these studies it is considered likely that most significant built heritage structures – homesteads/dwellings, outbuildings and farming infrastructure - have been identified. Due to a lack of extensive field assessments to search for archaeological sites, particularly those that comprise subsurface elements (i.e. house footings, wells, etc.) the studies have likely only identified a small proportion of historical archaeological sites in the WPNGW.

implications for the WPNGW area

A total of 68 known historical sites occur in the WPNGW area (see Figure 19: Heritage Places). These include a range of site types relating to the agricultural use and settlement of the area. None of these sites have increased significance, which is reflected by an absence of historical sites listed on the Heritage Register. Excluding the stone walls, many of the sites occur in proximity to roads or major rivers - indicating the importance of road infrastructure and water in relation to areas that were a focus of past post-contact settlement.

The results of this assessment indicate that the study area is most likely to contain further historical sites. These will generally be associated with early European pastoral and agricultural activities and the use of the area as a communication link with the Victorian goldfields. The types of sites represented are expected to include rural dwellings and infrastructure comprising archaeological remains and extant structures. These places are likely to be present as subsurface and surface archaeological features (i.e. the remains of rural structures/dwellings, outbuildings, infrastructure, wells, quarries, rubbish deposits etc.). The network of stone walls are likely to be more extensive than recorded to date.

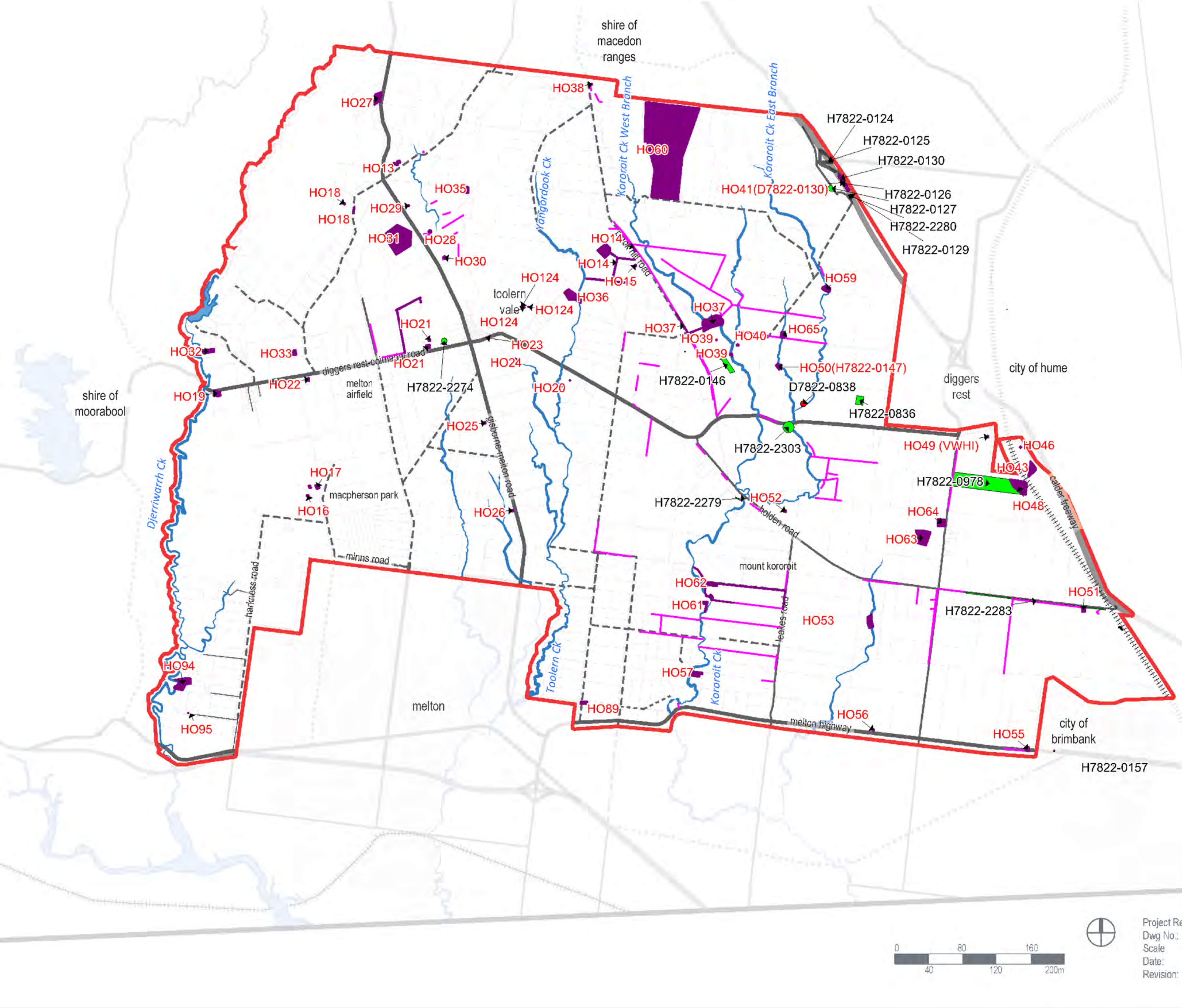
Dry stone walls are one of the more prominent heritage elements in the green wedge

western plains north green wedge management plan

figure19: heritage assets

legend

- study area
- heritage inventory site (indicated by H7822 - or D7822- prefix)
- heritage overlay sites (indicated by HO prefix)
- dry stone wall



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9.2 aboriginal cultural heritage

This section presents the results of the desktop review of relevant Aboriginal cultural heritage reports and databases in order to identify Aboriginal cultural heritage values relevant to the study area.

The study area has been subject to six localised archaeological assessments, three Cultural Heritage Management Plans (CHMPS) and three regional assessments. Localised archaeological investigations and CHMPs provide an indication of the nature of Aboriginal places present within the study area and those likely to be present elsewhere. Regional archaeological assessments provide contextual information with which to interpret these localised investigations. Given the high number of archaeological assessments within the study area only those that have involved a field survey component and/or subsurface investigation that resulted in the identification of Aboriginal cultural heritage are considered to be relevant as part of this study and a summary can be found at Appendix 3.

registered aboriginal places

A search of the Victorian Aboriginal Heritage Register (VAHR) established that 71 Aboriginal places and two historical references occur within the study area (see Figure 19: VAHR Places). The Aboriginal places predominately comprise stone artefact scatters. Earth features and an ochre quarry are also registered. These places are situated primarily on escarpment landforms overlooking water resources, on the creek valley slopes and creek floodplain. In some cases places are situated up to 500 m from these resources across the adjacent volcanic plain.

Stone artefact scatters occur as low to moderate density surface scatters, dominated by locally available silcrete and quartz. High density surface stone artefacts have been recorded, immediately to the south and east of the WPNGW area, in proximity to silcrete outcrops, representing intense quarrying activity (VAHR 7822-2266, -1656). Within the WPNGW area, Vines (1994) identified large silcrete cores (40 artefacts) associated with an Aboriginal mound (VAHR 7822-0666) next to an ochre quarry (VAHR 7822-0667) on the bank of the west branch of Kororoit Creek.

Other raw materials present in the stone artefact scatters include quartz, quartzite and basalt. Aboriginal stone artefacts comprise flakes, formal tools, cores, and flaking debris (associated with silcrete quarrying) made on silcrete, quartz, quartzite and basalt. Stone artefacts identified at VAHR 7822-0743 and -0745 included geometric microliths which are associated with the ASTT and broadly date to the last 5,000 years (Holocene).

Appendix 3 contains a summary of those registered Aboriginal places within the WPNGW area as well as a table of all Aboriginal places. These results are visually displayed in Figure 20 on the following page.

aboriginal place summary

The VAHR data set is likely to at least partially reflect field conditions, the extent, and locations of archaeological subsurface testing programs, field surveys, and field methods. Nevertheless some interesting trends are apparent in this data and are worth discussing within the context of these limitations:

- 60 of 71 registered Aboriginal places within the study area comprise stone artefact scatters, with a further eight having a stone artefact scatter component. Earth features, a quarry and an Aboriginal Historical Place have also been recorded. Stone artefacts have been collected from one Aboriginal place;
- Aboriginal places are located within proximity to water resources (i.e. creeks, drainage lines, swamps), on the escarpment/break of slope, hill slope, terrace and floodplain associated with these resources, and up to 500 m from water resources across the adjacent volcanic plain;
- Stone artefacts are also found in low densities on high points of the volcanic plain (Mt Tophet, Mt Kororoit, She Oak Hill);
- A small number of stone artefact scatters have a subsurface component comprising of stone artefacts;
- Aboriginal cultural heritage which occurs in subsurface deposits is most commonly present within the top 250 mm of silty clay topsoils. Along Jacksons Creek cultural heritage has been identified in alluvium up to 500mm deep (outside of the WPNGW area);
- Stone artefacts are made primarily on silcrete with lower densities of quartz, quartzite and basalt, and include flakes, cores, debitage and tools (i.e. geometric microliths, scrapers);
- Earth features occur as mounds along the bank of Kororoit Creek West Branch. One quarry (ochre deposit) occurs on the western side of Kororoit Creek within the creek embankment;
- The Aboriginal historical place refers to a ceremonial meeting place at Mt Tophet (VAHR 7822-1056); and,
- Two registered historical references occur within the study area Mt Tophet, a ceremonial place (4.2-8) and Mt Tophen [sic] Burials (9.2-12).

scope and limitations of previous assessments

Archaeological assessments have only covered a small proportion of the area, and these have mostly been limited to field surveys. Where subsurface testing has been undertaken, it has occasionally resulted in the identification of Aboriginal stone artefacts in subsurface deposits. For instance, Feldman (2009) identified isolated stone artefacts at depths of 200-250mm in compact clay silt on the escarpment overlooking Djerriwarrh Creek.

The Mount Tophet area has links to aboriginal cultural heritage

cultural values of the wurundjeri

broader aboriginal values

As part of the WPNGW management plan Elders from the Wurundjeri Tribe Land & Compensation Cultural Heritage Council Inc held a cultural recording field day with Melton City Council. The purpose of the field day was to document Wurundjeri Elders' cultural values and aspirations relating to the WPNGW. The outcomes of this exercise was documented in a report prepared by Wurundjeri, and provided in Appendix 4 of this report. A brief summary of the report is provided below.

For the Wurundjeri people the natural world is a cultural world and therefore the Wurundjeri have a special interest in preserving not just their cultural objects, but the natural landscapes which are cultural landscapes. The Wurundjeri Elders raised the following points:

- High points in the WPNGW are important as locations that would have been used to see and communicate with other groups through fire and smoke signals.
- Natural resources are valued as they were used for food, medicine, and for tool making (i.e. timber for spears; edible plant tubers).
- Remnant native vegetation is an important reminder of what the landscape was like prior to European settlement.
- creeks and waterways were particularly important to Wurundjeri ancestors for their flora and fauna resources. They also served as travelling routes and places where inter-group meetings took place.
- Aboriginal associations to the WPNGW area in the post-contact period held significance for Wurundjeri people as they demonstrate how Aboriginal people continued to use the landscape and its resources after European settlers arrived.
- Archaeological cultural heritage sites are important to the Wurundjeri people as they provide the Wurundjeri community with an opportunity to reconnect with their ancestors and their past.
- The Elder's have a spiritual connection to country which is enhanced by visiting country, working on country and caring for country.

wurundjeri aspirations

Wurundjeri proposed the following ways of incorporating Aboriginal cultural values into the WPNGW management plan:

- The development of an ongoing collaborative land management approach between the Wurundjeri, Melton City Council and other local land and water managers. For instance this could lead to incorporating Traditional Ecological knowledge into local land and water management practices such as traditional burning.
- The education of the broader community through interpretive signage and assigning Aboriginal names to places.

9.3 key considerations and issues:

- A range of Aboriginal places have been registered in the study area, and it is likely that many more occur in the area. Aboriginal places with increased archaeological significance include an Aboriginal quarry, a stone artefact scatter that contains large silcrete cores and earth features.
- The major rivers and creeks such as Kororoit Creek, Toolern Creek and Djerriwarrh Creek have high archaeological potential and will also have cultural values to traditional owners.
- The mountains and hills in the study area are also likely to be of significance to traditional owners.
- Two historical references to post-contact use of Mt Tophet and nearby areas by Aboriginal people indicate that this area is particularly significant.

Field day with Wurundjeri Tribe Land & Compensation Cultural Heritage Council

Creeks are another area with strong cultural heritage associations

western plains north green wedge management plan

figure 20: aborigional heritage assets

legend

- study area
- artefact scatter 60
- artefact scatter / aborigional historic place 1
- artefact scatter / earth feature 5
- artefact scatter / object collection 1
- artefact scatter / quarry 1
- earth feature 3
- historic reference 2

shire of macedon ranges
shire of moorabool
city of hume
city of brimbank
melton

Green Hill
Flagstaff Hill
Sheoak Hill
Mt Tophet
Mt Kororoit
mount kororoit

toolern vale
melton airfield
macpherson park
diggers rest

Djerriwarrh Ck
Yangardook Ck
Kororoit Ck West Branch
Kororoit Ck East Branch
Toolern Ck
Kororoit Ck

diggers rest-coimadai road
black hill road
gisborne-melton road
holden road
calder freeway
harkness road
minns road
teakes road
melton highway

0 40 80 120 160 200m

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10 attributes: people

An understanding of the people who live in the Green Wedge area will also be valuable and must inform any successful Management Plan. While much information on the residents and people who use the area will be gained through consultation, this section provides a more high level assessment of some of the relevant information.

10.1 demographics: rural areas of melton

The following is a brief demographic profile of Rural Balance in the City of Melton. The data and graphs have been collated from the Melton City Council website, provided by population experts, .id forecasting. Rural Balance comprises the non-urban parts of the City of Melton. Rural Balance is bounded by Macedon Ranges Shire in the north, the locality of Diggers Rest, the railway line, the localities of Hillside and Caroline Springs, the Western Freeway and Brimbank City in the east, Wyndham City in the south, and Moorabool Shire, the Werribee River, the localities of Brookfield, Melton South, Melton, Kurunjang and Melton West, and Moorabool Shire in the west.

While the data does not corresponded exactly with the study area, it includes all that land and is considered a good guide to the characteristics of the relevant population.

population

The population for Rural Balance in 2011 (usual residence) was 4,534 persons. This means an increase of 1,008 persons since 2006, when the population (usual residence) was 3,526 persons. This equates to an increase of over 20%. The population is therefore growing in the rural areas of Melton, as well as the urban areas.

However, it is notable that the PPWCMA report into Melbourne's green wedges (*Square Pegs in Green Wedges*) noted that the population density in these areas, while increasing, was still significantly below that in other similar areas of Melbourne. This was identified as a result of relatively larger lots sizes, smaller amounts of land zoned to allow residential populations and a high degree of absenteeism (discussed in section 7).

View north from Toolern Vale, one of the key settlements in the rural balance.

age structure

Analysis of the service age groups of Rural Balance in 2011 compared to the City of Melton shows that there was a lower proportion of people in the younger age groups (0 to 17 years) and a higher proportion of people in the older age groups (60+ years). Overall, 17.2% of the population was aged between 0 and 17, and 15.0% were aged 60 years and over, compared with 28.8% and 10.7% respectively for the City of Melton.

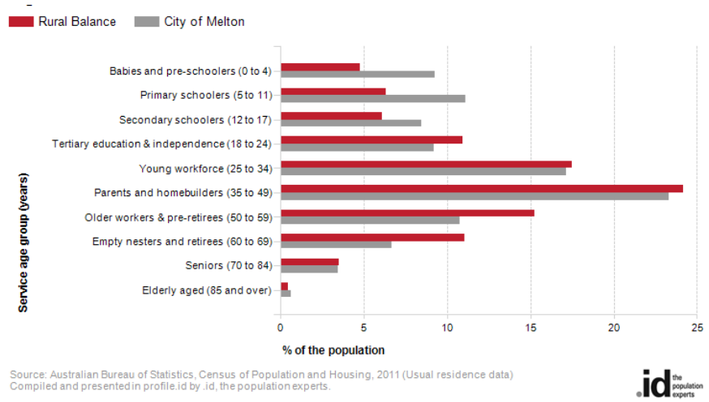


Figure 21: city of melton rural balance, age structure 2011

From 2006 to 2011, Rural Balance's population increased by 1,008 people (28.6%). This represents an average annual population change of 5.16% per year over the period. The largest changes in age structure in this area between 2006 and 2011 were in the following age groups:

- Young workforce (25 to 34) (+271 persons)
- Parents and homebuilders (35 to 49) (+267 persons)
- Empty nesters and retirees (60 to 69) (+195 persons)
- Tertiary education & independence (18 to 24) (+138 persons)

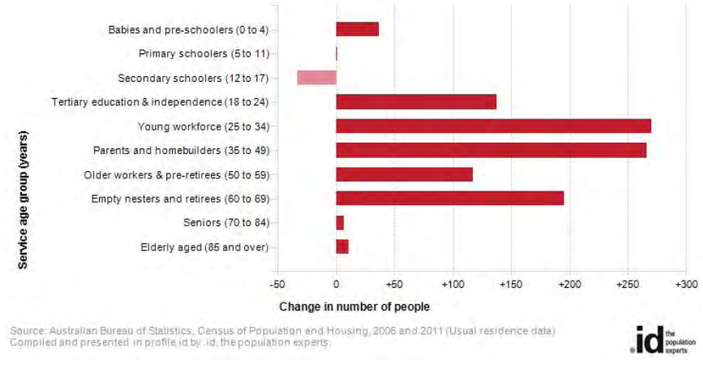


Figure 22: city of melton rural balance, change in age structure 2011

household types

Analysis of the household/family types in Rural Balance in 2011 compared to the urban areas of the City of Melton shows that there was a lower proportion of couples with children as well as a lower proportion of one-parent families. Overall, 36.7% of total families were couples with children, and 7.4% were one-parent families, compared with 43.4% and 13.0% respectively for the City of Melton.

There were a higher proportion of Lone Person Households and a higher proportion of Couples without Children. Overall, the proportion of Lone Person households was 20.7% compared to 15.7% in the City of Melton while the proportion of Couples without Children was 26.0% compared to 21.2% in the City of Melton.

The number of households in Rural Balance increased by 272 between 2006 and 2011. The largest changes in family/household types in Rural Balance between 2006 and 2011 were:

- Couples without children (+110 households)
- Lone person (+78 households)

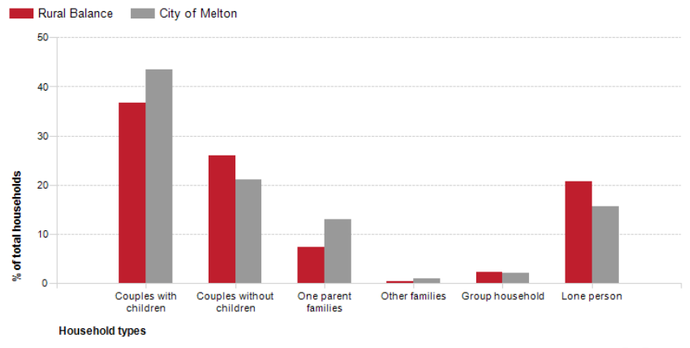


Figure 23: melton rural balance, household types 2011

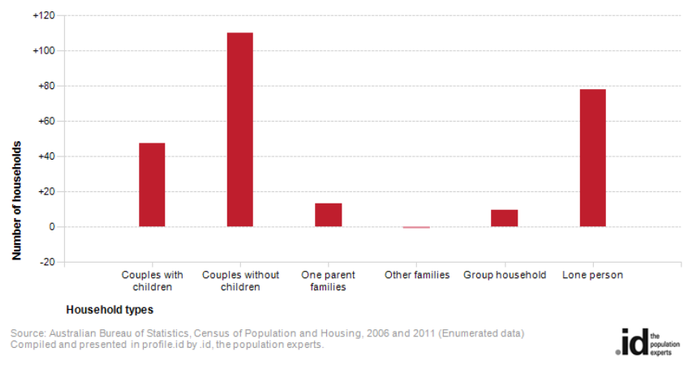


Figure 24: melton rural balance, household change 2011

income

Analysis of individual income levels in Rural Balance in 2011 compared to the City of Melton shows that there was a lower proportion of persons earning a high income (those earning $1,500 per week or more) as well as a lower proportion of low income persons (those earning less than $400 per week). Overall, 6.4% of the population earned a high income, and 27.9% earned a low income, compared with 8.7% and 34.6% respectively for the rest of the City of Melton.

employment by industry

An analysis of the jobs held by the population in Rural Balance in 2011 shows the three most popular industry sectors were:

- Construction (300 people or 17.2%)
- Transport, Postal and Warehousing (198 people or 11.4%)
- Manufacturing (197 people or 11.3%)

In combination these three industries employed 695 people in total or 39.8% of the employed resident population.

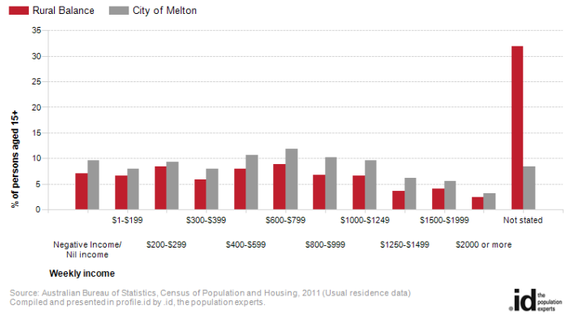


Figure 25: melton rural balance, weekly income 2011

The number of employed people in Rural Balance increased by 386 persons between 2006 and 2011. The largest changes in the jobs held by the resident population between 2006 and 2011 in Rural Balance were for those employed in:

- Construction (+85 persons)
- Education and Training (+70 persons)
- Transport, Postal and Warehousing (+65 persons)
- Public Administration and Safety (+49 persons)

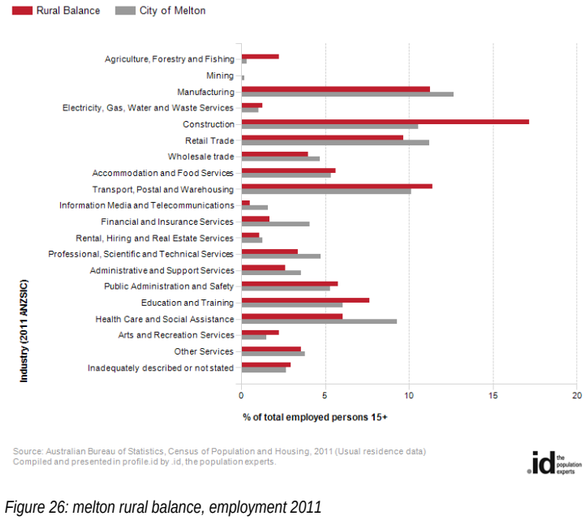


Figure 26: melton rural balance, employment 2011

Agricultural use in the green wedge area

Residence within the green wedge area

11 key issues and influences

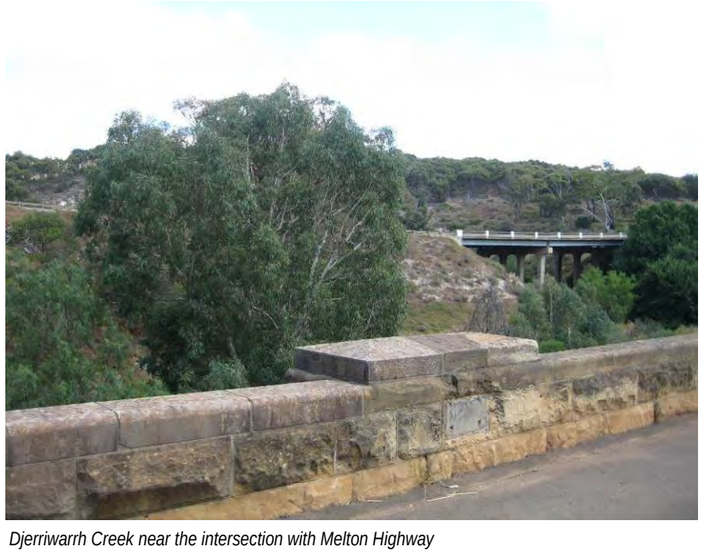
While there are a number of issues which arise out of the background analysis documented in the previous section, many of those are interrelated and opportunities that exist to address one issue (for instance, the protection of waterways) also offers opportunities to address others, such as the recognition of Aboriginal cultural heritage.

The Port Phillip and Westernport Catchment Management Authority (PPWCMA) report into the western green wedges (including the WPNGW) concluded that *"there are a number of factors which combine to present a formidable barrier to promoting positive rural land management, including the dearth of commercially viable agriculture, a high level of absentee landholding, a low sense of attachment to the land and a weak sense of community, high expectation of development and substantial hostility to government"* These are obviously significant challenges which indicate that the status quo and continuation of current practices will only achieve further degradation of the Green Wedge. An exploration of new opportunities within the area which respond to the specific conditions within the WPNGW and provide a range of land uses which promote greater flexibility of use and an increased sense of ownership of the land will be necessary.

This section (and Figure 21: Key Issues and Influences Plan) provides a high level overview of the key issues and influences. These will form the basis of matters that will need to be explored further through the *Vision and Community Views Report* which will form the next part of this project. Opportunities to address these issues and respond to the influences will be documented through that work and will ultimately help inform the preparation of the *Green Wedge Management Plan*. Identified key issues are as follows:

- How to ***manage the on-going maintenance of agricultural land*** in a way which responds to the overall vision for the Green Wedge while acknowledging the significant challenges facing agriculture within the City of Melton. This includes the need to respond to threats to agricultural uses such as reduced rainfall and land fragmentation, and acknowledgement of the differing land capability in parts of the study area. It also needs to acknowledge the desires of landowners in undertaking agricultural uses within the Green Wedge. Considering in more depth the types of agricultural uses which may be more likely to succeed in the area and responding to those, providing guidance on which uses may have a future and exploration of steps Council may be able to take in ensuring existing businesses are sustainable will be vital.
- Exploring other ***ways that environmental assets and the rural landscape can contribute to sustainable economic development*** in light of the challenges facing agriculture will also be important. This includes exploring ways to encourage tourism opportunities and other complimentary uses, which may allow landowners to consider alternative uses for their land to generate an income stream while not compromising the values which make the Green Wedge important in the first place.
- One of the key issues which faces any green wedge, and Melbourne's western green wedges in particular, is the ***pressure for urban related uses.*** These pressures manifest themselves in a range of ways including the provision of infrastructure utilities to service new and existing residential populations. Demand also includes land uses such as churches and schools which face difficulties in the acquisition of parcels of land within urban areas, due to cost or size requirements. This pressure also results in the uncertainty or unwillingness to establish meaningful agricultural uses in these areas at the urban interface as a result of land prices prohibiting the consolidation of lots or issues with managing the interface between the semi-industrial nature of modern farming and large residential populations.
- This pressure for urban related uses is exacerbated by the existing uncertainty in the ***long term alignment of the metropolitan Urban Growth Boundary***. The process by which the UGB is reviewed periodically means that there is a reluctance of some landowners to use their land for the intended purpose under the current zoning in the expectation that this zoning will change in the future. This process can also mean that land is not maintained for a use in the interim to avoid compromising further urban expansion opportunities. This uncertainly also creates concerns among other landowners that the preservation of larger lots within the area is intended to facilitate long term urban expansion, rather than agricultural uses, increasing resistance to the maintenance of larger lot sizes.
- Fundamental from an environmental perspective is the ***protection of important remnant ecosystems*** within the study area; grasslands within the study area being among the most depleted and most vulnerable of Victoria's ecosystems. Identifying innovative ways to not only protect, but also to enhance, the remaining grasslands (having regard to other important issues such as wildfire risk) will be fundamental. Education regarding the value of these grasslands will also need to be considered given the generally acknowledged difficulty in broader community appreciation of the value of grasslands. There are a number of endangered species which are present in the study area which increases both the legal and moral obligation to protect these ecosystems. In addition to the grasslands, there are also a number of important woodland areas within the Green Wedge which are also home to a range of flora and fauna and which need to be considered.
- How to ***increase protection and enhancement of waterways*** and associated heritage and environmental assets to increase resilience of these important systems will also need to be considered. The study area's waterways contribute key landscape values, and the legibility of the landscape within the study area by allowing people to orientate themselves with reference to the corridors. However they also play vital roles in the ecosystem of the study area, as well as being the site of many key examples of Aboriginal heritage and home to endangered species such as the Growling Grass Frog. Furthermore they offer significant opportunities for recreation for the residents of Melton. As with many waterways proximate to urban areas however, without careful management these waterways are under significant threat due to a range of related issued outlined in earlier sections.
- The management plan will also need to consider the ***appropriate balance between rural residential areas and the threat of bushfire*** which exists in the northern parts of the study area. This includes not only any future rural residential uses but also the existing development, including a number of small hamlets. The current extent of forested slopes (part of the Lerderderg State Park) and the surrounding areas will need clear direction in order to meet State requirements for the prioritisation of the protection of human life.
- The identified route of the Outer Metropolitan Ring Road across the south eastern corner of the study area will essentially 'cut off' this section of land from the remainder of the Green Wedge. The best ***future uses for the potentially isolated south-east corner of land*** will need to be considered carefully as it will be difficult to maintain any productive agricultural uses in this area both during construction of the road and following its development.

Remnant grassland under protection


Djerriwarrh Creek near the intersection with Melton Highway

- The plan will also need to consider how to manage the ***broader impacts on the Green Wedge from people and their actions***. These impacts range from the accidental, such as the introduction of pest species and domestic animals through poor land management or control of domestic animals, to the more deliberate, in terms of the dumping of rubbish or land fill from nearby urban development. The Management Plan will need to carefully assess what, in additional to current successful programs, may be needed to minimise these impacts. A lack of understanding in relation to best practice land management, particularly among newer residents also needs to be addressed.
- How to achieve maximisation of ***opportunities afforded by the recycled water pipeline*** will also need to be considered. While this pipeline runs through the study area, there has been only sporadic take up of the additional water. Understanding why this take-up has been fairly limited and what may assist in using this resource to support new and existing agricultural uses in the areas will be important.
- The management plan will also need to carefully consider how to respond to the constraints, currently identified or not, which may be associated both the ***Tullamarine Airport and the Melton Airfield***. Under State Policy the plans will need to ensure that any plan does not compromise the operations of Tullamarine Airport, and indeed, the Plan should explore further potential opportunities which may be associated with both airfields.
- To the north of the study area, beyond the major areas of urban growth, the ***protection of significant landscapes and key vistas*** will be an important consideration. North of Diggers Rest, urban growth is really contained on the eastern side of the Calder Freeway and pressures are unlikely to be as significant as in other areas. However, there may be pressure to establish appropriate uses within the Green Wedge due to visibility from the freeway. The current open vistas from the freeway across to the Pyrete Range are significant and the plan will need to consider how to avoid these being compromised. There are also a number of other open vistas across the study area, particularly form the north, where views are available to the Melbourne CBD across the lower grasslands.
- Along with the protection of these open vistas, it will also be important that the Management Plan ***recognise, protect and enhance unique topographical features***. As the high points in a generally flat landscape, there will be inevitable pressures on the volcanic cones within the study area. Considering parameters for how these features could be developed or protected and clearly articulating their value to the broader landscape will be important. This applies not only to Mount Kororoit, (which is protected by and existing Significant Landscape Overlay) but also other features such as Sheoak Hill, Mount Tophet, Mount Aitken, as well as Green and Flagstaff Hills.
- The current ***disconnection of MacPherson Park*** from the urban area of Melton and the relationship and connections between activity in this area and Melton will also need to be considered as part of the project. Exploring how use of existing facilities can be maximised while responding to other issues such as pressure for urban uses will be important.
- Another key issue affecting the study area is ***pressure for fragmentation and re-subdivision*** along major roads and close to urban areas. This particularly affects the major connector roads running though the study area, but also the land to the east of the Toolern Creek where there is an existing pocket of comparatively smaller lot subdivisions. Current planning controls within Melton encourage this outcome but allowing subdivision of a cluster of smaller lots provided a larger lot is also retained.
- Another influencing factor is the ***extent of existing scattered heritage places related to the early settlement*** of the area. This is reflected not only in the Dry Stone Wall driving trail which extends into the area but also the extent of existing Heritage Overlays in the northern part of the study area particularly. Recognising these important reminders of both Melton's early settlement, and more broadly Melbourne's, establishment should be considered as part of the management plan. Aboriginal cultural heritage outlined in section 9 of this report should also be recognised and opportunities to draw on this knowledge and history should be explored further
- The other issue which arises out of the establishment of future, but also existing rural living opportunities is the ***appropriate management of these rural living areas particularly where they are in proximity to urban and creek environs***. This particularly applies to the Harkness Road rural living area. While Council has recognised the need for the DPO control on this land to be reviewed, it is important that when this is undertaken it reflects both the role of the areas as a transition from the urban to natural environments, but also seeks a positive response to the creekline and improves access where possible.
- There are also current extractive industry activities occurring within the study area. These uses play an important role in supporting development across the broader area, but have a numbers of potential conflicts with surrounding land uses, and are subject to a range of controls which can be impacted by decisions regarding surrounding land uses. Quarry activities are also highly visible and can have a significant impact on some of the larger feature of the landscape, as is occurring currently at Sheoak Hill. Therefore, ensuring ***the ongoing use of these quarry sites*** is not compromised and that new quarry activities are located appropriately having regard to landscape and existing uses is another issue that must also be considered
- Further to the above there is an overarching issue that drives decision making with regard to the Green Wedge and this is ***landowner expectations***. The majority of the Green Wedge land is managed by private landowners who have a range of different expectations about what they should be allowed to do with their land and also what should occur within the broader area. Managing these expectations will be a key challenge given responding to one set of landowner expectations may compromise another. Furthermore, this project must be undertaken in the context of the zoning of the land, which has always been used for rural purposes. Expectations of subdivision or non-rural uses have likely arisen through a lack of clarity about the Victorian planning system, the purpose of the land and the opportunities associated with it. It is therefore vital this project ensures it provides a clear direction and communicates the implications of this clearly to landowners. This needs to be understood in the context of the existing planning system which does not allow for ad-hoc decision making in response to individual expectations but seeks to provide a strategic direction which provides a net community benefit.

These key issues and influences will form the basis of the matters for consideration as part of the development of the *Western Plains North Green Wedge Management Plan* and are illustrated diagrammatically on the following page, where relevant.

Views to the south form the Melton-Gisborne Road

Mount Kororoit

western plains north green wedge management plan

figure 27: key issues & influences plan

shire of macedon ranges

shire of moorabool

city of hume

city of brimbank

melton

taylors hill

western plains south green wedge

green hill

flagstaff hill

mount tophet

the gap

black hill road

toolern vale

diggers rest-coimadai road

melton airfield

gisborne-melton road

diggers rest

calder freeway

holden road

macpherson park

minns road

harkness road

djerriwarrh creek

mount kororoit

leakes road

melton tourism precinct

melton highway

legend

- appropriate balance between rural residential areas and the threat of bushfire
- pressure for fragmentation of land along main roads & close to urban areas
- appropriate management of these rural living areas where they are in proximity to urban and creek environs
- consider new agricultural practices and other economic development that responds to the rural landscape
- recognise, protect and enhance unique topographical features
- pressure for urban related uses
- fragmentation and isolation of land due to proposed OMR
- increase protection and enhancement of waterways
- scattered settlement heritage
- maximisation of recycled water pipeline opportunities
- protection of highway vistas
- protection of important remnant ecosystems
- protection of important remnant woodlands
- impacts from people and their actions
- disconnection of macpherson park
- manage airfield impact
- manage quarry interfaces
- recognise important viewpoints
- tourism opportunities

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