

# CHAPTER 09

## SUSTAINABILITY AND RESILIENCE



Plan Melbourne Outcome 6:  
Melbourne is a sustainable and  
resilient city

Plan Melbourne aims to create a resilient and sustainable city. It recognises the need to mitigate greenhouse gas emissions, reduce exposure to natural hazards and undertake whole of water cycle planning. It also encourages resource efficiency and promotes the benefits of urban cooling and greening.



Photo credit: Tim Bell Studio

The Eastern Metro Region has the highest tree canopy coverage in metropolitan Melbourne and lower surface temperatures than other Melbourne regions. With these benefits, however, come certain risks: forested areas and some urban areas in the Eastern Metro Region are highly susceptible to floods, bushfires and damage to property, infrastructure and public assets from extreme weather events.

Green infrastructure (trees, vegetation, green spaces and water systems) play an important role in maintaining water supply catchments, providing habitat and contributing to the character of parks and green wedges.

## State of play

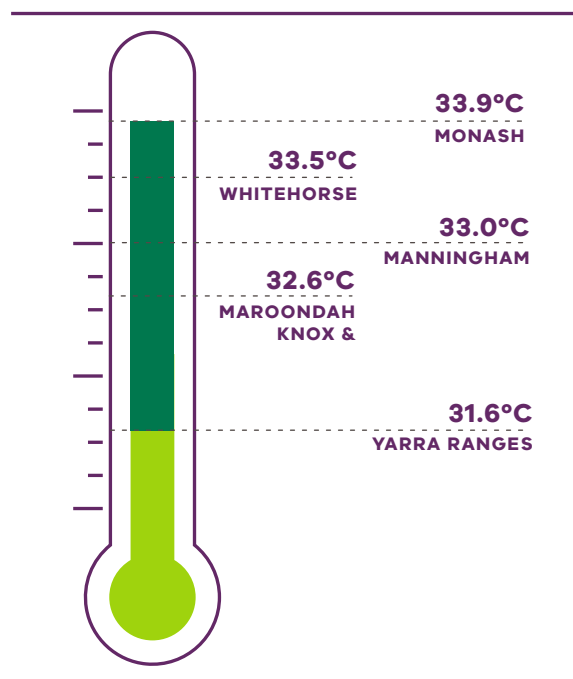
### Urban heat environments

By 2050, the average annual temperature in the Eastern Metro Region is forecast to increase between 0.8° and 3.0° Celsius under a medium emissions climate change scenario (Clarke, et al., 2019). As our climate warms the number of people exposed to the risk of mortality from heatwaves will increase. Older people, younger people, those with pre-existing illnesses and people with fewer resources to adapt are more at risk on hot days and in prolonged periods of hot weather.

Although the Eastern Metro Region is the coolest within Metro Melbourne, it is still estimated that around 23,000 residents in the region were exposed to high urban heat conditions in 2018 (Urich, C. & Hardy, M., 2020). The average land surface temperature (LST) in the Eastern Metro Region was 32.8° Celsius, and LST was highest in Monash LGA (33.9°Celsius) and coolest in Yarra Ranges LGA (31.6°Celsius), as shown in Figure 22.

There are scattered areas of urban heat across the inner-west portion of the Eastern Metro Region including the Monash NEIC, Clayton, Glen Waverley, Bayswater, Boronia and Croydon. These areas have less trees and more hard surfaces compared to other areas possessing higher vegetation cover and, in particular, higher tree canopy cover. This means individual suburbs within the region offer different levels of amenity on hot days.

**FIGURE 22. Average land surface temperature by LGA, 2018**

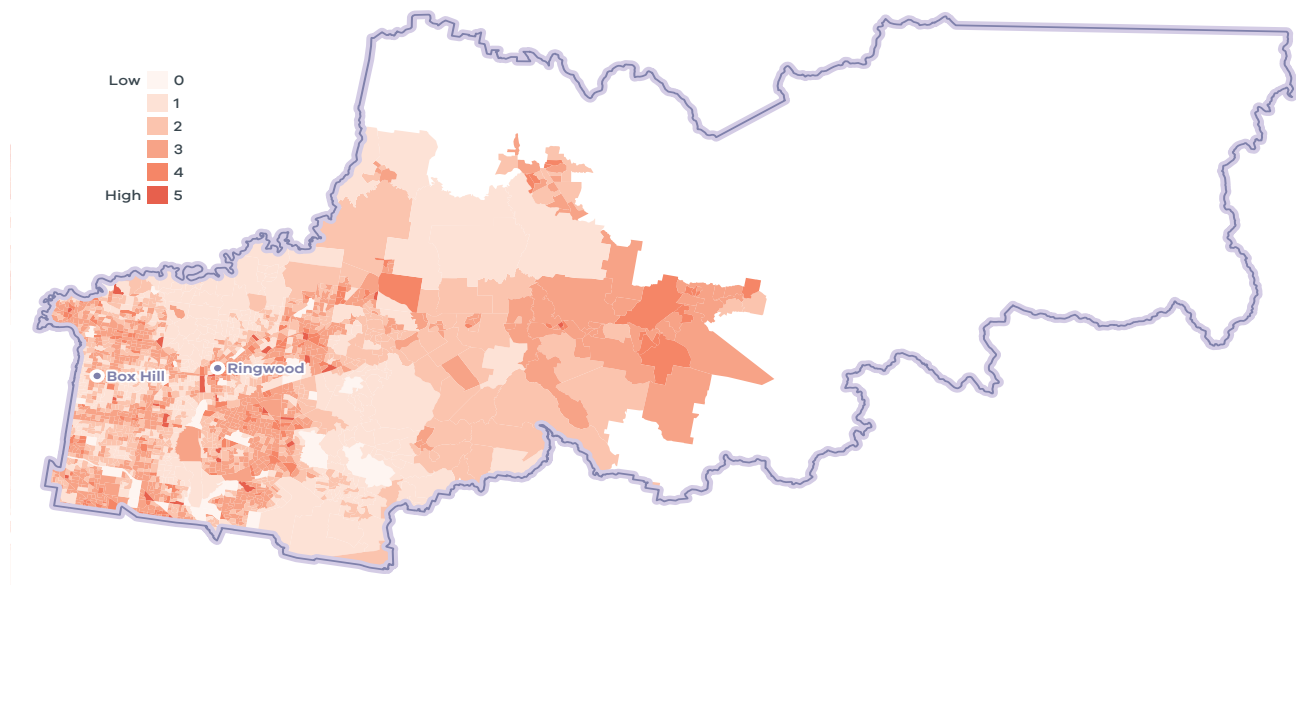
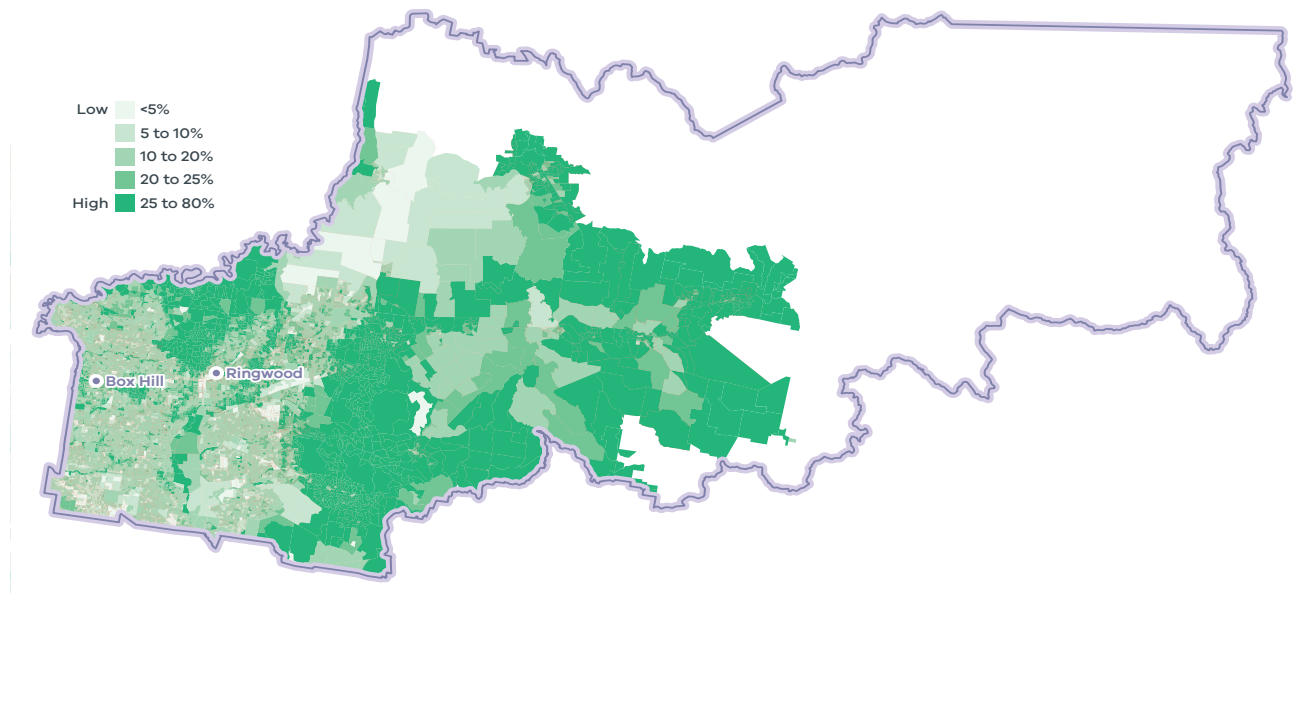


**Source:** Department of Environment, Land, Water and Planning (2018) *Land Surface Temperature Data, State of Victoria, Melbourne, Australia.*

Urban environments that stay cooler on hot days are more physically comfortable to humans and animals and continue to support movement and recreation. As the number and duration of hot days increases, these environments will be important to reduce the likelihood of heat-related illness. Cooler urban environments are characterised by more tree cover, less hard surfaces, more water infiltration into the ground and fewer heat-absorbing building materials.

### Vegetation cover

Vegetation cover is a defining feature of the Eastern Metro Region, which in 2018 had 61 per cent vegetation cover and 27 per cent tree canopy cover including both urban and non-urban areas. This is 14 per cent more vegetation cover and almost 11 per cent more tree cover than the metropolitan average and the highest of Melbourne's metropolitan regions (Hurley, et al., 2018b). The Eastern Metro Region as a whole contributed 39,096 hectares of tree canopy cover and 88,355 hectares of combined vegetation cover (grass, shrubs and trees) to Melbourne (Hurley, et al., 2018b).

**FIGURE 23.** Heat vulnerability index map for the Eastern Metro Region, 2018**FIGURE 24.** Eastern Metro Region tree canopy cover, 2018

## Urban tree canopy

Trees provide cooling, amenity, habitat, and recreation and respite to residents. In 2018, the Eastern Metro Region had around 26 per cent urban tree cover, higher than the metropolitan average of 15.3 per cent (Hurley, et al., 2018a).

The region accounted for 40 per cent of Melbourne's overall tree canopy coverage in urban areas, with tree canopy varying across the region. Most urban tree canopy is on residential land, parkland and linear infrastructure such as streets (Figure 25).

In 2018, the Yarra Ranges had the highest urban tree canopy cover of almost 37 per cent, reflecting its interface with the Dandenong Ranges while Monash had around 14 per cent urban canopy cover (Figure 26) (Hurley, et al., 2018a).

Between 2014 and 2018 the Eastern Metro Region had the largest loss of tree canopy of any metropolitan region. Maroondah and Whitehorse LGAs had the highest loss of average tree canopy of all metropolitan LGAs. The high level of urban tree canopy loss in the Eastern Metro Region was offset by gains in the Inner, Western and Northern metro regions (Figure 26) (Hurley, et al., 2019).

All local councils in the Eastern Metro Region have adopted the *Living Melbourne Urban Forest Strategy*, specifying targets for the Eastern Metro Region of 30 per cent total tree canopy and 50 per cent total tree and shrubs canopy by 2050 (The Nature Conservancy and Resilient Melbourne, 2019).

## Water supply

Melbourne sources most of its water from remote, forested mountain streams and enjoys some of the best quality natural water in world (Melbourne Water, 2020).

The Eastern Metro Region includes significant water catchment and storage areas such as the Yarra River, the Upper Yarra open water catchment and the Upper Yarra, Silvan, Maroondah and O'Shannassy reservoirs. These water catchments and storage facilities are regionally-significant assets that provide around 70 per cent of Melbourne's drinking water.

Healesville, McCrae's Creek, Mick's Creek and Britannia Creek are all officially recognised as Declared Special Area Water Supply Catchments in the Eastern Metro Region.

## Flooding risk

Stormwater flooding is prevalent in urban areas of the Yarra River catchment in the Eastern Metro Region. Higher volumes of stormwater during periods of heavy rain impact the health of rivers and their tributaries (DELWP, 2018a).

While overall annual rainfall will reduce as a result of climate change, the region is predicted to see more frequent and intense rainfall events that will increase the risk of flooding (DELWP, 2018a). Flooding may also be exacerbated by an increase in impervious surfaces and stormwater flows unless this risk is properly managed.

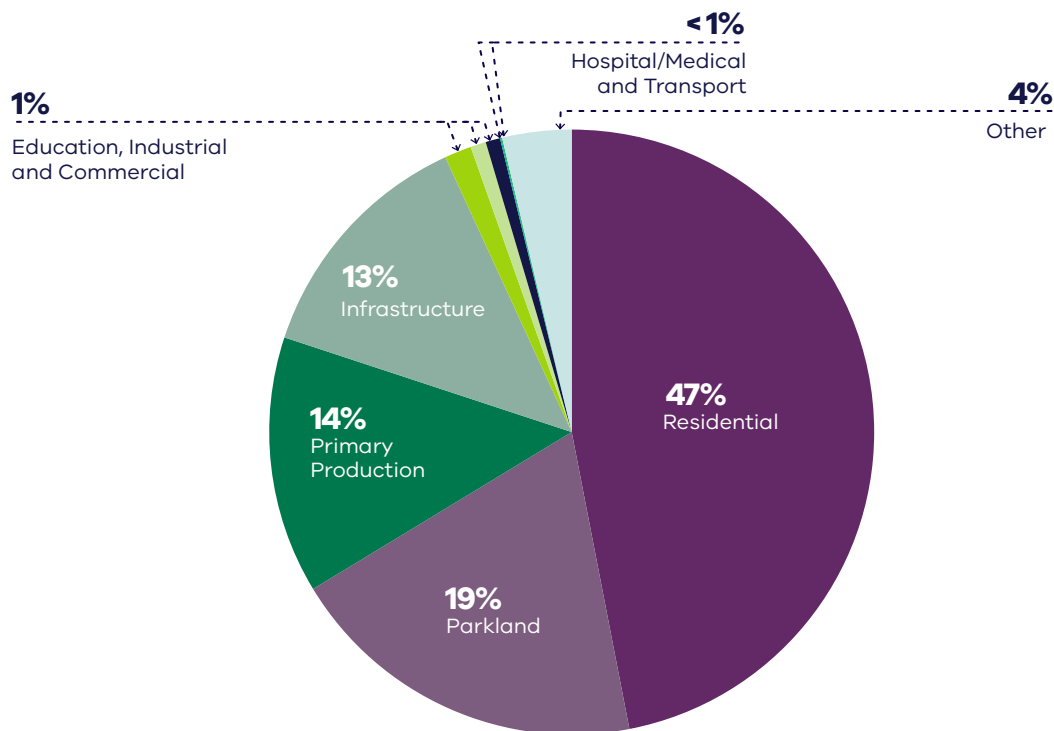
Harvesting stormwater and increasing water infiltration are important in dense suburbs to reduce runoff and service vegetation. Stormwater and recycled water can support the maintenance of water-reliant facilities and amenities such as sporting fields and gardens, contribute to more resilient vegetation, reduce demand on drinking supplies and improve the environment of receiving streams and rivers.

## Bushfire risk

The Eastern Metro Region has bushfire risk at the local and landscape scale as shown in Map 8. There are large areas of land, mostly beyond the urban area in the green wedges, already governed by State planning policy for bushfire (Clause 13.02), the Bushfire Management Overlay (BMO) and Bushfire Prone Areas (BPA). The likelihood of a bushfire, its severity and intensity depend on a site's location and surrounding landscape characteristics.

The BMO aims to strengthen community resilience to bushfire by considering bushfire measures as part of the design process and ensuring new development achieves an acceptable level of bushfire risk in areas of highest bushfire risk. However, there is still a need to strengthen the resilience of settlements and communities to bushfire. Strategic risk-based planning that prioritises the protection of human life over other policy considerations should extend to sensitive uses and uses that encourage high visitation to the green wedges during hotter months.

Bushfire risk exists in the heavily vegetated environments of the Yarra Ranges and in vegetated areas across most established urban areas the region. The frequency and intensity of bushfires in the Dandenong Ranges is forecast to increase with climate change. Bushfire poses a serious threat to the region's communities, infrastructure and high-value forests and ecosystems (DELWP, 2018a). Planning for the risk of bushfire will be vital as the climate warms and overall rainfall decreases.

**FIGURE 25.** Urban tree canopy cover by land use, 2018

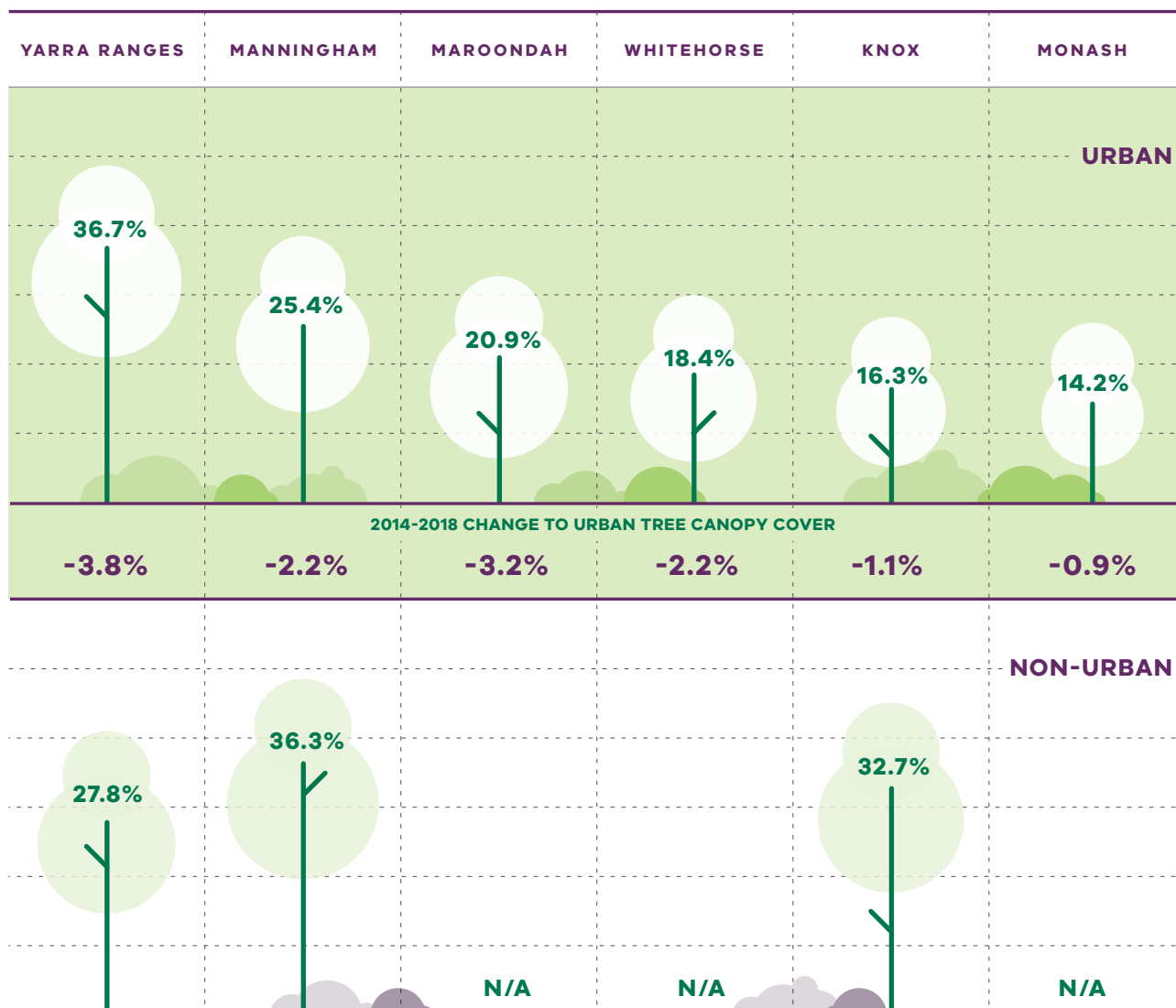
**Source:** Hurley, J., et al. (2019) Melbourne Vegetation Cover 2018, Eastern Region, Department of Environment, Land, Water and Planning, Melbourne, Australia.

### Sustainability in the built environment

In 2013, residential buildings were responsible for nearly 12 per cent of Australia's national greenhouse gas emissions, and commercial buildings contributed just over 11 per cent. The majority of these emissions were generated through the consumption of grid-supplied electricity to power appliances, lighting, and predominantly heating, ventilation and cooling (HVAC) systems (Australian Sustainable Built Environment Council, 2016).

As average temperatures rise due to climate change, greater numbers of people are expected to seek comfort indoors during high heat conditions. This, combined with population growth and overall poor-performing building stock, means our city lacks energy efficiency and resilience on hot days. Maximising opportunities to incrementally improve the performance of buildings will reduce our reliance on appliances to cool buildings and contribute to a lower likelihood of blackouts during periods of hot weather.

Local councils within the Eastern Metro Region are active in adopting policies and strategies to reduce carbon emissions and improve the sustainability of the built environment. Many are innovators and leaders in environmentally sustainable development (ESD) through their strategies and are implementing new practices to improve the energy efficiency of their civic buildings and reduce emissions from operations.

**FIGURE 26. Tree canopy cover 2018 and tree canopy cover change 2014 to 2018, by LGA**

**Source:** Hurley, J., Saunders, A., Amati, M., Boruff, B., Both, A., Sun, C., Caccetta, P., and Duncan, J. (2019) *Melbourne Vegetation Cover 2018, Eastern Region*, Department of Environment, Land, Water and Planning, Melbourne, Australia.

Hurley, J., Saunders, A., Both, A., Sun, C., Boruff, B., Duncan, J., Amati, M., Caccetta, P. and Chia, J. (2019) *Urban Vegetation Cover Change in Melbourne 2014 - 2018*, Centre for Urban Research, RMIT University, Melbourne, Australia.

All of the region's LGAs are members of the Council Alliance for a Sustainable Built Environment (CASBE), an association committed to designing and applying a range of practical methodologies to increase sustainability outcomes for new buildings (CASBE, 2021). The Built Environment Sustainability Scorecard (BESS) is an online tool developed by CASBE that assesses the sustainability of proposed developments. It aims to reduce waste and improve energy efficiency from the outset of the construction phase, through to occupation. As well as onsite energy generation, BESS promotes the use of energy-efficient appliances, thermally-efficient

glazing, wall cladding and insulation, water-efficient fittings and fixtures, thermal comfort and overall environmentally sustainable performance.

Other rating systems being increasingly utilised by the building design industry to measure and assess the performance of ESD principles include Green Star (Green Building Council of Australia, 2021), NatHERS (Department of Industry, Science, Energy and Resources, 2021) and MUSIC (eWater, 2021).

MAP 8. Eastern Metro Region sustainability and resilience state of play

Precincts and Activity Centres

- National employment & innovation cluster (NEIC)\*
- Metropolitan activity centre
- Major activity centre

Transport

- State-significant road corridor
- Road network
- Train station
- Rail network

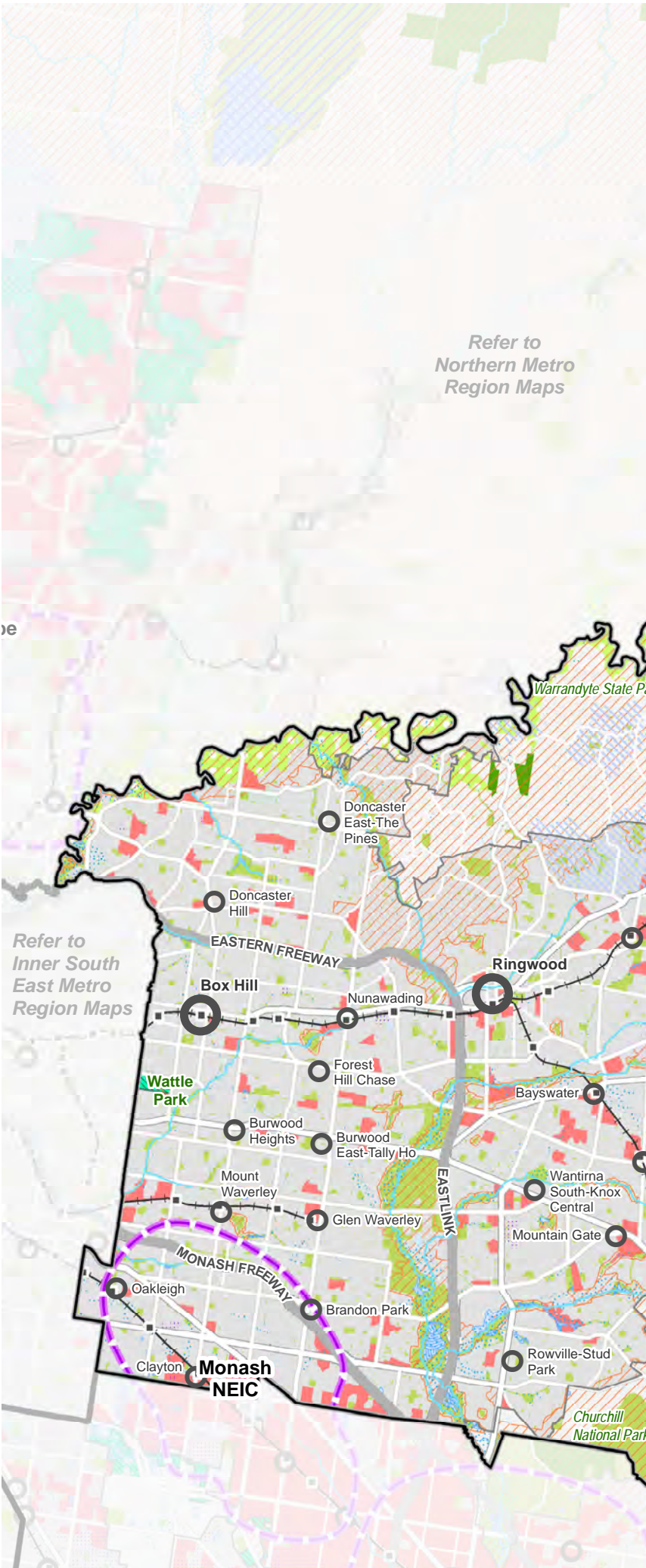
Environment

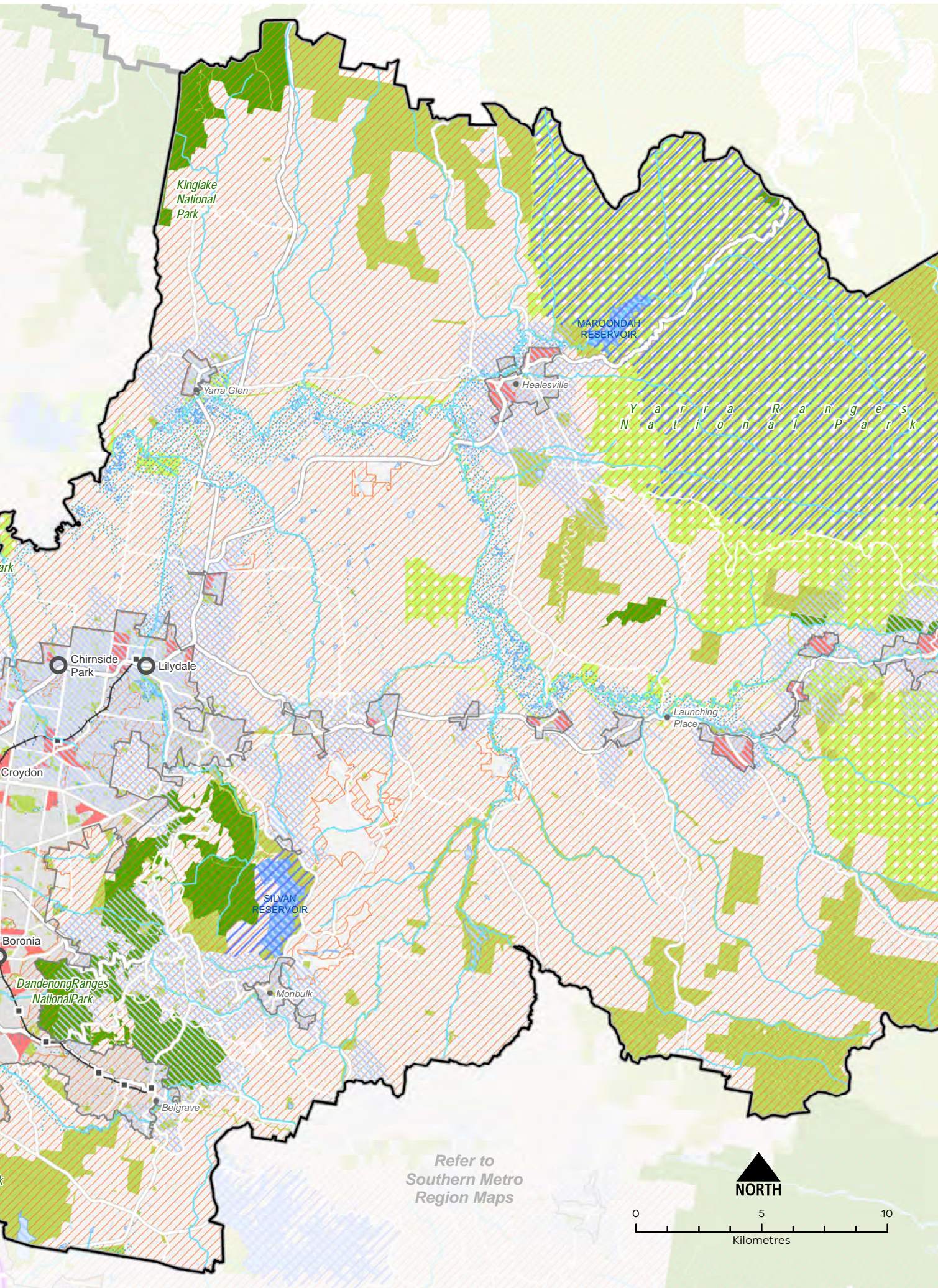
- National park/state park
- Regional park - expanded/improved
- Public open space
- Yarra River land
- Wetlands
- Waterway
- Areas subject to flooding (existing planning controls)
- Priority stormwater sub catchments
- Water supply catchment (closed & uninhabited)
- Reservoir
- Waterbody
- Bushfire risk area (Bushfire Management Overlay + bushfire prone area)
- High heat vulnerability areas (HVI >3)
- High land surface temperatures

Land use/Administration

- Regional boundary
- Green wedge land
- Urban area
- Urban growth boundary

\*NEIC boundary is indicative only and subject to detailed planning.





## Regional strengths

- The region has the highest tree canopy coverage in metropolitan Melbourne; however, it also has the highest rates of tree canopy loss due to continuing pressure to accommodate growth.

## Regional challenges

- The region's drinking water supply catchments are essential to Melbourne's liveability and require protection.
- Environmental risks such as waterway health and bushfire hazards are key considerations for future planning.
- Green infrastructure can play a significant role in reducing the urban heat of public places and spaces.
- Urban stormwater management and water harvesting can assist in managing flooding risk and supporting green infrastructure.

## Directions and strategies

The following directions have been developed to achieve the 2050 vision for the Eastern Metro Region in terms of maximising sustainability and climate change resilience:

|                     |   |
|---------------------|---|
| <b>Direction 23</b> | Minimise and reduce bushfire risk to buildings and communities  |
| <b>Direction 24</b> | Increase the network of cool places, particularly in areas with communities vulnerable to urban heat and areas with high urban heat |
| <b>Direction 25</b> | Increase urban tree canopy across the Eastern Metro Region to achieve 30 per cent coverage by 2050                                  |
| <b>Direction 26</b> | Integrate green infrastructure with land use and infrastructure change to maintain cool urban environments                          |
| <b>Direction 27</b> | Protect the role of the Eastern Metro Region as the major water catchment for Melbourne   |
| <b>Direction 28</b> | Increase the retention and reuse of water in the urban and rural environments to contribute water security and enhance waterways    |

Each direction is implemented through a number of strategies, which together will ensure the Eastern Metro Region is sustainable and resilient in accordance with Outcome 6 of Plan Melbourne.

**Map 9** shows the extent of green urban areas, cool urban areas, public open space and waterway catchments across the Eastern Metro Region by 2050 as a result of these directions and strategies.

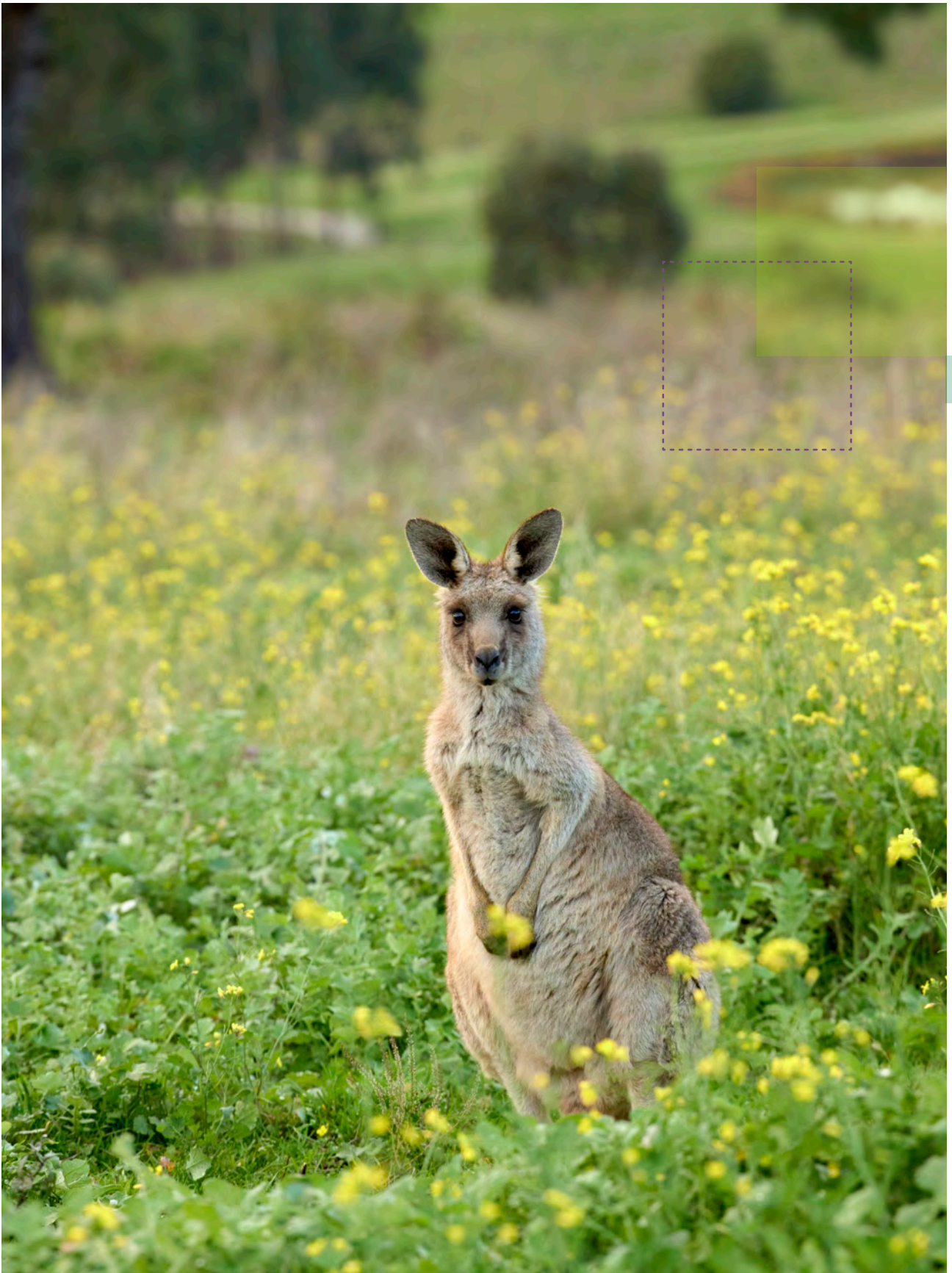









Photo credit: Tim Bell Studio

MAP 9. Eastern Metro Region sustainability and resilience 2050

Precincts and Activity Centres

-  National employment & innovation cluster (NEIC)\*
-  Metropolitan activity centre
-  Major activity centre





Transport

-  State-significant road corridor
-  Road network
-  Train station
-  Rail network

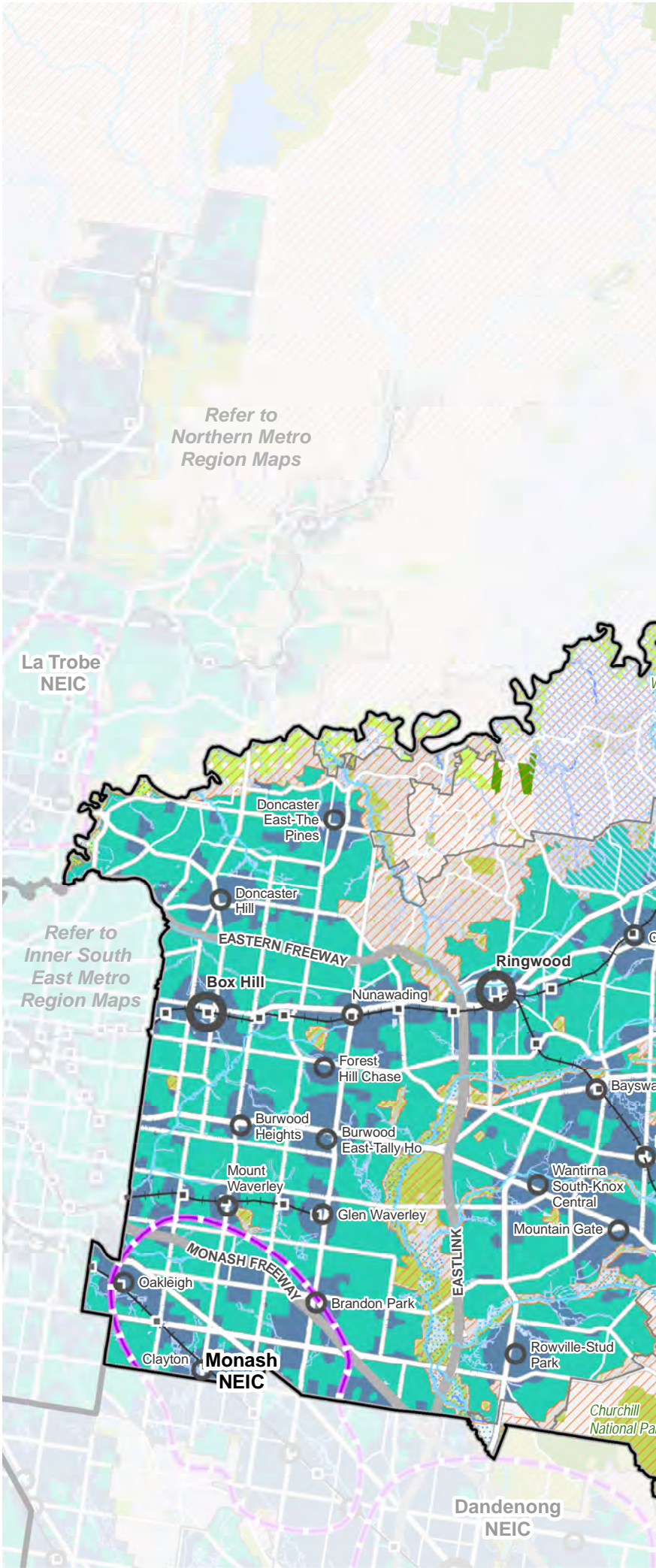
Environment

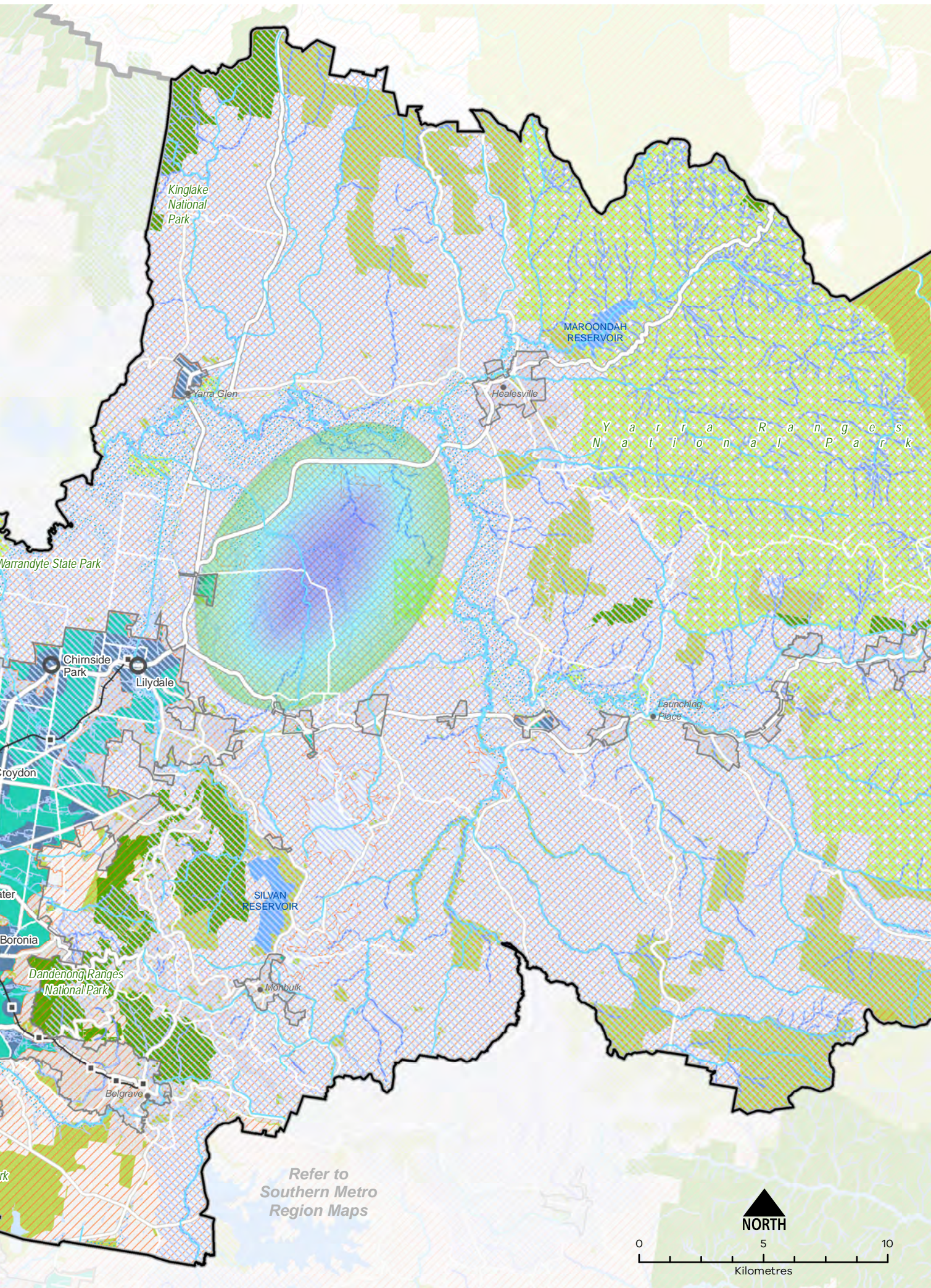
-  National park/state park
-  Public open space
-  Yarra river land
-  Waterway
-  Areas subject to flooding (Melbourne Water)
-  Priority areas for enhanced stormwater management
-  Priority waterways for enhanced vegetation
-  Indicative recycled water supply areas
-  Reservoir
-  Waterbody
-  Bushfire Risk Area (Bushfire Management Overlay + bushfire prone area)
-  Priority - urban heat response
-  Priority - expand urban tree canopy cover

Land use/Administration

-  Regional boundary
-  Green wedge land
-  Urban area
-  Urban growth boundary

\*NEIC boundary is indicative only and subject to detailed planning.





**DIRECTION 23.****Minimise and reduce bushfire risk to buildings and communities**

Bushfire risk, frequency and severity will continue to increase as our climate warms. The Eastern Metro Region will need to plan for the evacuation of people from areas of higher bushfire risk to safer refuge areas on days of extreme fire risk.

Bushfire risk can be reduced through land use and infrastructure planning that incorporates bushfire protection measures and seeks to maximise separation between the hazard and built form. Vegetation management, including lower risk species selection and maintenance, will have a key role in urban areas.

In order to prioritise the protection of human life from bushfire, population growth and development should be directed to low-risk locations and areas that are safely evacuated. Development within areas of the highest bushfire risk must achieve acceptable levels of risk reduction. These areas should be avoided for development that will accommodate more vulnerable populations, such as the elderly or very young, that may have difficulties evacuating in the event of a bushfire.

Careful management of vegetation and water resources will be required across the Eastern Metro Region in response to bushfire risk. River and creek corridors will continue to be important as the climate warms to provide habitat, recreation and cooling. However, given their higher levels of vegetation, they will also pose bushfire risk. Vegetation management strategies, including selecting lower risk species and maintaining vegetation, will have a key role in mitigating risk in urban areas while recognising the value of these corridors for habitat and urban cooling.

**STRATEGY 70.** Avoid housing growth and sensitive land uses within and in proximity to bushfire prone areas in the Yarra Ranges, Manningham, Knox and Maroondah LGAs.

**STRATEGY 71.** Provide new and upgraded regional social infrastructure that provides refuge in extreme bushfire and weather events.

**STRATEGY 72.** Recognise and manage bushfire risk posed by vegetation within waterway corridors.

**DIRECTION 24.****Increase the network of cool places, particularly in areas with communities vulnerable to urban heat and areas with high urban heat**

More tree canopy cover, permeable surfaces and water in the urban environment will help reduce urban temperatures and create cooler, more comfortable local micro-climates across the Eastern Metro Region. Plan Melbourne notes that temperature decreases of between 1° Celsius and 2° Celsius can have a significant impact on reducing heat-related morbidity and mortality.

In addition to trees, green walls, shade structures and low heat absorbing building materials can help reduce urban surface temperatures and create cool urban areas. These techniques will be important to incorporate in the Monash NEIC and in activity centres located in the inner-west portion of the Eastern Metro Region that experience high urban heat. The residents of these communities are at a higher risk of heat-related illness during periods of multiple hot days. Within these areas, land uses frequented by older people and children, who are more vulnerable to urban heat, will need to provide for more active cooling of outdoor environments.

Buildings with vegetation and roof gardens will need to be combined with onsite rainwater harvesting and storage to maintain vegetation health and reduce potable water demand.

**STRATEGY 73.** Increase tree canopy and water sensitive urban design in areas with high urban heat vulnerability and high urban heat.

**STRATEGY 74.** Design and develop outdoor spaces that are cool on hot days through the use of water-permeable paving, vegetation and water sensitive urban design in the Monash NEIC and in the Clayton, Glen Waverley, Bayswater, Boronia and Croydon major activity centres.

**STRATEGY 75.** Encourage green roofs and green structures with climate resilient planting and irrigation on apartment developments in areas with high urban heat and large commercial and industrial sites.

**DIRECTION 25.****Increase urban tree canopy across the Eastern Metro Region to achieve 30 per cent coverage by 2050**

Trees provide an essential service for the surrounding environment. In the absence of water, trees and in particular clusters of trees, make the greatest contribution to reducing surface temperatures, along with contributing to stormwater infiltration, amenity and biodiversity.

These important functions are vital for sustainability and resilience as our climate warms and the Eastern Metro Region's population and major centres grow.

Increasing vegetation on public and private land to create corridors of vegetation will support improved biodiversity, reduce stormwater impacts and reduce urban heat. Local planning should consider the transition of some corridors to higher risk bushfire environments and guide land use, water and vegetation management to manage bushfire risk in these areas.

Infrastructure, such as streets, rail corridors, existing and new arterial roads and large at-grade car parks can play a multi-purpose role for both movement and greening to contribute to urban forest targets. Green boulevards are encouraged along road plantations and street verges.

All Eastern Metro Region LGAs have endorsed the *Living Melbourne: Our Metropolitan Urban Forest* strategy, specifying a regional target of 30 per cent total tree canopy and 50 per cent combined tree canopy and shrubs by 2050 (The Nature Conservancy and Resilient Melbourne, 2019). To support this commitment, the tree canopy target is accompanied in Table 13 by an aspirational distribution of tree canopy cover across four different land use types, adapted by DELWP from several related datasets (Hurley, et al., 2018a) (Urich & Hardy, 2020) (PSMA Australia Limited, 2021).

**TABLE 13. Eastern Metro Region tree canopy cover target and aspirational distribution**

| 2018 TREE CANOPY COVER: 25.9%                           |     |
|---|-----|
| 2050 TREE CANOPY COVER TARGET: 30%                      |     |
| (+4.1% OR +2,685 HECTARES ADDITIONAL TREE CANOPY COVER) |     |
| Private land:   | 45% |
| Streets, roads and rail:                                | 15% |
| Parks, open space and waterways:                        | 35% |
| Education and community Infrastructure:                 | 5%  |

**STRATEGY 76.** Protect more trees on private land outside of locations identified for higher levels of housing and mixed-use change.

**STRATEGY 77.** Support alternative siting of buildings and more compact building forms to retain mature canopy vegetation.

**STRATEGY 78.** Increase tree canopy on streetscapes, public land, large development in activity centres, along urban waterways, open spaces and road reserves, and large commercial and industrial sites.

**DIRECTION 26.****Integrate green infrastructure with land use and infrastructure change to maintain cool urban environments**

Public and private land both make significant contributions to the tree canopy cover of the Eastern Metro Region, with existing vegetation fundamental to the region's sense of place.

One of the challenges of increasing the tree canopy is the ability to retrofit existing urban areas with green infrastructure (trees, vegetation, green spaces and water systems) due to the availability of public and private space and its multiple functions. For example, there are potential conflicts with transport movement and electrical powerlines, underground cabling, gas and stormwater pipe works and regulations.

Most of the Eastern Metro Region's growth will be accommodated in and around activity centres and other identified locations with good access to existing services and transport infrastructure. Some areas will need a precinct or site responsive design to retain mature trees. Other sites will be less able to accommodate trees and other cooling and greening methods will be required.

While some locations will be more constrained, tree planting and water sensitive urban design (WSUD) may yield greater co-benefits, such as reduced urban temperatures, local climate regulation and stormwater benefits.

Making space, providing good growing conditions and using stormwater in high use activity locations will be important to maintain comfortable outdoor environments. Locations designated for higher levels of growth and change are a priority for urban heat response measures. Other priority locations for planting and WSUD are activity centres and activity corridors, train stations and bus stops.

**STRATEGY 79.** Design and develop outdoor spaces that are cool on hot days through materials, vegetation and water sensitive urban design particularly in the Monash NEIC, Box Hill and Ringwood metropolitan activity centres, major activity centres, activity corridors, and state- and regionally-significant health and education precincts.

**STRATEGY 80.** Provide green roofs and green structures with climate resilient planting and irrigation on apartment developments in areas with high urban heat and large commercial and industrial sites.

**DIRECTION 27.****Protect the role of the Eastern Metro Region as the major water catchment for Melbourne**

There is limited public access to Melbourne's declared catchments to minimise impacts on drinking water quality. However, as the Eastern Metro Region's population grows, there may be additional pressure on bushland environments for recreational use. It is important to the resilience and sustainability of Melbourne that we continue to protect the important role of water supply catchments.

Key threats to the health of Melbourne's water catchments include bushfire risk, and human and animal contamination. Bushfires can impact the quality and quantity of water through ash and sediment, and result in less water entering the reservoir while the forests recover from bushfire which can take over a century.

Additionally, some of Melbourne's water is sourced from open water supply catchments, including the Mid-Yarra catchment upstream of Sugarloaf Reservoir and Yering Gorge. The Mid-Yarra catchment is Melbourne's largest open drinking water supply catchment, at around 142,000 hectares. Of this approximately 33 per cent is zoned for primary production, 20 per cent for residential and 23 per cent for conservation. There are 90,000 residents and up to 23,000 onsite domestic wastewater systems within the catchment. It is also a popular tourist destination. Human activities that occur in the Mid-Yarra catchment mean that water supplied from Sugarloaf Reservoir requires filtration at the Winneke water treatment plant.

**STRATEGY 81.** Maintain protection for Declared Special Water Supply Catchments and minimise threats to catchment health through land use planning.

**STRATEGY 82.** Update planning protection required to manage the water quality of the mid-Yarra open water supply catchment.

**DIRECTION 28.****Increase the retention and reuse of water in the urban and rural environments to contribute water security and enhanced waterways**

Integrated stormwater management, reduced runoff into waterways and wetlands, and water recycling will improve climate resilience and liveability across the Eastern Metro Region.

The Eastern Metro Region will undergo significant built form and land use change over the coming decades, resulting in increased impervious surfaces. More impervious surfaces increase rapid runoff and downstream flooding, and negatively affects water quality and waterway health for aquatic life.

Land around the Yarra River and Dandenong Creek, and other areas across the region, are subject to flooding overlays such as the Land Subject to Inundation Overlay (LSIO) and the Special Building Overlay (SBO).

Development can reduce the impacts of flooding, support healthy vegetation and prepare for drying conditions by increasing permeable areas, increasing proportions of green space, avoiding paved areas and passively irrigating vegetation.

In addition to managing flood risk, there is an opportunity to increase the stormwater and floodwater harvesting capabilities in the Eastern Metro Region. This is particularly important in developing urban centres where impervious areas and flooding can increase the risk and the cost of property and infrastructure damage, and at the top of catchment in priority stormwater sub-catchments (DELWP, 2018a).

Local stormwater capture, water recycling and water sensitive urban design of open spaces and new residential subdivisions will improve the region's hydrological and ecological systems and allow for revegetation of urban waterways. A regional approach is needed to capture the full value of stormwater harvesting and accelerate the delivery of projects (DELWP, 2018a).

Development also increases the quantity of wastewater generated in urban areas, which provides another opportunity to diversify water sources. For example, wastewater can be recycled and used to irrigate public open space and sporting grounds. This will help improve water security as the climate warms and overall rainfall decreases. Further, wastewater contains nutrients and organic matter that could be used to create valuable products such as fertilisers and energy sources. Given increasing limits in resource availability, this creates an opportunity to expand the benefits of wastewater management by exploring different options for resource recovery.

Within the rural context, access to fit-for-purpose water underpins productive agriculture. A potential area for water recycling has been identified in the Yarra Valley around Coldstream. Recycled water could be supported in this location through existing wastewater treatment infrastructure and water pipe networks.

The Victorian Government's strategies *Water for Victoria* and *Integrated Water Management Framework for Victoria* provide the strategic framework for water management in Victoria. At the regional scale, options to increase the retention and reuse of water in the urban environment should be based on the actions contained in the Yarra Catchment Scale Integrated Water Management Plan (IWM), flooding strategies, relevant sub-catchment IWM plans and local governments' IWM plans.

These plans should be used as the basis to support governments and relevant agencies to prioritise and align water infrastructure needs and deliver integrated water management outcomes. This may include the preparation of an appropriately scaled IWM Plan (i.e. sub-catchment, precinct or local scale) by the lead planning authority in collaboration with relevant referral agencies to guide sustainable water design and development decisions.

**STRATEGY 83.** Improve regional water outcomes by aligning sub-catchment and local IWM planning with opportunities and directions identified at the catchment scale.

**STRATEGY 84.** Facilitate stormwater harvesting close to the source in priority sub-catchments.

**STRATEGY 85.** Facilitate stormwater harvesting at a range of scales throughout the region and places designated for high levels of change.

**STRATEGY 86.** Support land uses that will enable greater use of recycled wastewater to best meet water needs, particularly for agriculture and around Coldstream in the Yarra Valley.

## **ACTIONS – Sustainability and resilience**

**ACTION 12.** Prepare a regional bushfire response for suburban and peri-urban communities that are subject to bushfire risk.

**ACTION 13.** Update planning provisions for flooding (i.e. Special Building Overlay, Land Subject to Inundation Overlay and Urban Flood Zone) to represent current and forecast flooding data.



