

# Living Corridors Action Plan

DRAFT REPORT

Prepared for City of Ballarat

16 November 2020

## Biosis offices

### NEW SOUTH WALES

#### Newcastle

Phone: (02) 4911 4040  
Email: [newcastle@biosis.com.au](mailto:newcastle@biosis.com.au)

#### Sydney

Phone: (02) 9101 8700  
Email: [sydney@biosis.com.au](mailto:sydney@biosis.com.au)

#### Wollongong

Phone: (02) 4201 1090  
Email: [wollongong@biosis.com.au](mailto:wollongong@biosis.com.au)

#### Albury

Phone: (02) 6069 9200  
Email: [albury@biosis.com.au](mailto:albury@biosis.com.au)

#### Western Sydney

Phone: (02) 91018733  
Email: [WesternSydneyOffice@biosis.com.au](mailto:WesternSydneyOffice@biosis.com.au)

### VICTORIA

#### Melbourne

Phone: (03) 8686 4800  
Email: [melbourne@biosis.com.au](mailto:melbourne@biosis.com.au)

#### Ballarat

Phone: (03) 5304 4250  
Email: [ballarat@biosis.com.au](mailto:ballarat@biosis.com.au)

#### Wangaratta

Phone: (03) 5718 6900  
Email: [wangaratta@biosis.com.au](mailto:wangaratta@biosis.com.au)

## Document information

**Report to:** City of Ballarat

**Prepared by:** Hannah Harbourd  
Matt Gibson  
Mitch Deaves

**Biosis project no.:** 30998

**File name:** 30998.CoB.LivingCorridorsActionPlan.Dft20201116

**Citation:** Biosis 2020.LivingCorridorsActionPlan. Report for City of Ballarat. Authors: Harbourd, H, Gibson, M, Deaves, M. Biosis Pty Ltd, Ballarat. Project no. 30998

## Document control

| Version          | Internal reviewer | Date issued |
|------------------|-------------------|-------------|
| Draft version 01 | BRH               | 7/07/2020   |
| Draft version 02 | MD                | 12/11/2020  |

## Acknowledgements

Biosis acknowledges the contribution of the following people and organisations in undertaking this study:

- Client: City of Ballarat (Vanessa O'Shea, Lisa Kendall & Lacey Gunn)
- Stakeholder Engagement Facilitation: Kismet Forward (Jen Lilburn)
- Working Group Members: Central Highlands Water, City of Ballarat, Country Fire Authority, Department of Environment, Land, Water and Planning, Federation University, Friends of Canadian Corridor, and Parks Victoria

Biosis staff involved in this project were:

- Matt Gibson (ecology)
- Julian Turner (mapping)
- Mitch Deaves and Ben Howells (quality assurance)

© Biosis Pty Ltd

This document is subject to copyright and may only be used for the purposes in respect of which it was commissioned and in accordance with the Terms of Engagement of the commission. Unauthorised use of this document in any form whatsoever is prohibited.

Disclaimer:

Biosis Pty Ltd has completed this assessment in accordance with the relevant federal, state and local legislation and current industry best practice. The company accepts no liability for any damages or loss incurred as a result of reliance placed upon the report content or for any purpose other than that for which it was intended.

# Contents

|          |                                             |           |
|----------|---------------------------------------------|-----------|
| <b>1</b> | <b>Introduction .....</b>                   | <b>4</b>  |
| 1.1      | Acknowledgement of Country .....            | 4         |
| 1.2      | Background .....                            | 4         |
| 1.3      | Purpose of the LCAP .....                   | 4         |
| 1.4      | Structure of LCAP .....                     | 6         |
| 1.5      | Ballarat Planning Framework.....            | 7         |
| 1.6      | Ballarat management organisations .....     | 8         |
| <b>2</b> | <b>Living Corridors.....</b>                | <b>10</b> |
| 2.1      | Ballarat's eastern living corridors.....    | 10        |
| 2.1.1    | Connectivity .....                          | 11        |
| <b>3</b> | <b>Community Values.....</b>                | <b>13</b> |
| 3.1      | Development of the LCAP .....               | 13        |
| 3.1.1    | Key findings from Community Engagement..... | 13        |
| 3.2      | Outcomes .....                              | 17        |
| <b>4</b> | <b>Vision and goals .....</b>               | <b>18</b> |
| 4.1.1    | Vision.....                                 | 18        |
| 4.1.2    | Goals .....                                 | 18        |
| <b>5</b> | <b>Strategies.....</b>                      | <b>19</b> |
| 5.1      | Native vegetation .....                     | 19        |
|          | Common species .....                        | 19        |
|          | Significant species.....                    | 20        |
| 5.1.1    | Issues .....                                | 21        |
| 5.1.2    | Key Objectives.....                         | 21        |
| 5.1.3    | Key Actions .....                           | 22        |
| 5.2      | Native wildlife.....                        | 25        |
| 5.2.1    | Issues .....                                | 26        |
| 5.2.2    | Key Objectives.....                         | 26        |
| 5.2.3    | Key Actions .....                           | 28        |
| 5.3      | Waterways.....                              | 31        |
| 5.3.1    | Issues .....                                | 31        |
| 5.3.2    | Key Objectives.....                         | 32        |
| 5.3.3    | Key Actions .....                           | 33        |
| 5.4      | Urban landscape.....                        | 37        |
| 5.4.1    | Issues .....                                | 37        |
| 5.4.2    | Key Objectives.....                         | 37        |
| 5.4.3    | Key Actions .....                           | 38        |
| 5.5      | Climate change and bushfire .....           | 41        |
| 5.5.1    | Issues .....                                | 41        |

|                                               |           |
|-----------------------------------------------|-----------|
| 5.5.2 Key Objectives.....                     | 41        |
| 5.5.3 Key actions.....                        | 42        |
| 5.6 Community awareness and involvement ..... | 44        |
| 5.6.1 Issues .....                            | 44        |
| 5.6.2 Key Objectives.....                     | 44        |
| 5.6.3 Key Actions .....                       | 45        |
| 5.7 Planning considerations.....              | 47        |
| 5.7.1 Issues .....                            | 47        |
| 5.7.2 Key Objectives.....                     | 47        |
| 5.7.3 Key Actions .....                       | 48        |
| 5.8 Measures of success .....                 | 51        |
| 5.8.1 Issues .....                            | 51        |
| 5.8.2 Key Objectives.....                     | 51        |
| <b>6 References .....</b>                     | <b>54</b> |

## Tables

|                                                                |    |
|----------------------------------------------------------------|----|
| Table 1 Legislation, policies, strategies and guidelines ..... | 7  |
| Table 2 Stakeholders .....                                     | 8  |
| Table 3 Native vegetation actions .....                        | 22 |
| Table 4 Native Wildlife Actions .....                          | 28 |
| Table 5 Waterways actions .....                                | 33 |
| Table 6 Urban landscape actions.....                           | 38 |
| Table 7 Climate change and bushfire actions .....              | 42 |
| Table 8 Community Awareness and Involvement actions .....      | 45 |
| Table 9 Planning actions .....                                 | 48 |
| Table 10 Implementation of measuring success of the LCAP.....  | 52 |

# 1 Introduction

---

## 1.1 Acknowledgement of Country

*The authors respectfully acknowledge the Traditional Custodians of the land in which the living corridors sit, the Wadawurrung and Dja Dja Wurrung People, and recognises their continuing connection to the land and waterways. We pay our respects to their Elders past, present and emerging and extend this to all Aboriginal and Torres Strait Islander People.*

## 1.2 Background

This Living Corridors Action Plan (LCAP) has been initiated by City of Ballarat (CoB) to advance initiative 5.9 of the Ballarat Strategy to: *support the management and rehabilitation of a network of living corridors across Ballarat to properly manage CoBs natural values in urban and township areas*. This LCAP is being focused on the eastern corridor of Ballarat, however developed so it is possible for future adoption throughout the wider Ballarat municipality. A detailed Background Report has been completed by Biosis which forms the initial stages of the LCAP (Biosis 2020).

The basis for the LCAP is the eastern side of Ballarat which includes a large section of forest and reserves. It includes Woowookarung Regional Park, and stretches from White Swan in the north to Buninyong in the south which contribute to a vegetated north-south corridor. The living corridors connect State Forests and other reserves near Creswick and Nerrina with vegetated areas around Mount Helen, Buninyong and further south (Scotsburn, Durham Lead and continuing through to Enfield). The living corridors are interrupted in some areas by urban development and major roads, which leads to opportunities for enhancement and improvements in connectivity (City of Ballarat 2019a).

The LCAP is comprised of a vision, goals, strategies, actions and implementation measures to better protect natural values such as native vegetation and biodiversity throughout the identified living corridors. The LCAP includes actions that can be delivered by the CoB, state agencies, landowners, and the community.

## 1.3 Purpose of the LCAP

The LCAP has been prepared to support the management and rehabilitation of a network of living corridors across Ballarat to properly manage CoBs natural values in urban and township areas.

The purpose of this LCAP is to:

- Identify a vision and strategic objectives for the living corridors.
- Review the current state of the environment in Ballarat.
- Review current relevant strategies and policies and provide a framework for coordinated and informed decision making.
- Engage with key stakeholders and community members and determine their interests and responsibilities.
- Recommend strategies to achieve the vision, strategic objectives and policy statements to achieve net gain of native vegetation and biodiversity.

- Recommend actions that can be implemented by CoB, community members, and in the Ballarat Planning Scheme.
- Identify and define short, medium and long-term actions that can be implemented by the CoB, State Agencies, developers or the community.
- Outline indicators for monitoring success of actions.

The LCAP is intended to provide a future planning and management tool for the eastern living corridors of Ballarat. In certain cases, where major research or large scale works are required and/or other stakeholders are responsible for implementing works, the LCAP identifies the need for additional actions, which may be subject to separate consultation, approval and funding arrangements.

## 1.4 Structure of LCAP

The structure of the LCAP is as follows:

- Provides an overview of the planning and management context.
- Establishes a vision and key goals for the LCAP informed by community and stakeholder consultation.
- Summarises the current state of environment
- Outlines strategies and actions for the LCAP based on the following themes:
  - Native vegetation
  - Native wildlife
  - Waterways
  - Urban landscape
  - Climate change and bushfire
  - Community awareness and involvement
  - Planning considerations
  - Measures of success

## 1.5 Ballarat Planning Framework

This section of the report provides a summary of the key legislation and policy that are relevant to protection and management of the living corridors at Commonwealth, State and local levels. A more detailed review of the relevant legislation, policy and guidelines as part of the background review for the LCAP (Biosis 2020).

**Table 1 Legislation, policies, strategies and guidelines**

| Legislation                                                                                                                                                                                                                                                                                                                                                                                                         | Policies and Strategies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Guidelines                                                                                                                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Commonwealth</b> <ul style="list-style-type: none"> <li>Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)</li> </ul>                                                                                                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>Australia's Biodiversity Conservation Strategy 2010-2020(Commonwealth of Australia 2009, pp. 2010–2020)</li> <li>Ballarat Open Space Strategy (BOSS) (City of Ballarat 2008)</li> <li>Ballarat City Integrated Water Management Plan (BCIWMP)( Ballarat City Integrated Water Management Plan, 2018)</li> <li>Ballarat Cycling Action Plan (BCAP)(City of Ballarat 2017)</li> <li>Ballarat East Local Area Plan (BELAP)(City of Ballarat 2019a)</li> <li>Ballarat Strategy 2040 (City of Ballarat 2015)</li> <li>Brown Hill Local Area Plan (BHLAP)(Tract, City of Ballarat n.d.)</li> <li>Central Highlands Regional Growth Plan (CHRGp) (Victorian Government 2014)</li> <li>Comprehensive Koala Plan of Management (CKPoM) (City of Ballarat n.d.)</li> <li>Living next to Nature(Living Next to Nature, 2016)</li> <li>Mt Buninyong Local Area Plan (MBLAP)(City of Ballarat)</li> <li>Nature Strip Policy (City of Ballarat 2016)</li> <li>Protecting Victorians Environment - Biodiversity 2037 (DELWP 2017)</li> <li>Urban Forest Action Plan (UFAP) (City of Ballarat 2019b)</li> <li>Woodmans Hill Gateway Precinct MasterPlan (Aurecon, City of Ballarat 2015)</li> <li>Woowookarung Regional Park Strategic Directions Plan (WRPSD)(Parks Victoria 2018)</li> <li>Yarrowee River Master Plan (City of Ballarat) (Adopted August 2020)</li> </ul> | <ul style="list-style-type: none"> <li>Living with Koalas (City of Ballarat n.d.)</li> <li>Water Sensitive Urban Design Guidelines City of Ballarat – Storm Water Management (City of Ballarat 2010)</li> </ul> |
| <b>State</b> <ul style="list-style-type: none"> <li>Aboriginal Heritage Act 2006 (AH Act)</li> <li>Catchment and Land Protection Act 1994 (CaLP Act)</li> <li>Environment Effects Act 1978 (EE Act)</li> <li>Environment Protection Act 1970 (EP Act)</li> <li>Flora and Fauna Guarantee Act 1988 (FFG Act)</li> <li>Planning and Environment Act 1987 (P&amp;E Act)</li> <li>Water Act 1989 (Water Act)</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                 |

## 1.6 Ballarat management organisations

**Table 2 Stakeholders**

| Stakeholder                                                                    | Role/responsibility/interest                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| City of Ballarat (CoB)                                                         | CoB is responsible for administering the Planning Scheme, local laws, and has initiated preparation of the Living Corridors Action Plan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Central Highlands Water (CHW)                                                  | CHW provide water supply and sewerage services through 71,054 water supply connections and 61,156 wastewater service connections to 149,842 residents throughout the Central Highlands region, including servicing Ballarat. CHW will play a key role in water management within the living corridors.                                                                                                                                                                                                                                                                                                                  |
| Community and 'friends of' groups                                              | Community and 'friends of' groups including Friends of Canadian Corridor and Landcare groups..                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Corangamite Catchment Management Authority (CCMA)                              | The CCMA works with land managers, communities, other organisations and governments to protect and improve the health of the region's natural resources in the Corangamite region. The CCMA has powers and functions under the CaLP Act in order to protect and manage catchments within the living corridors.                                                                                                                                                                                                                                                                                                          |
| Country Fire Authority (CFA)                                                   | CFA is a volunteer and community-based fire and emergency services organisation. CFAs vision is to work together with communities to keep Victorians safe from fire and other emergencies. CFA have been involved in developing the LCAP whilst considering bushfire risk.                                                                                                                                                                                                                                                                                                                                              |
| Department of Environment, Land, Water and Planning (DELWP)                    | Department Of Environment, Land, Water And Planning brings together Victoria's climate change, energy, environment, water, forests, planning, local government and emergency management functions into a single department to maximise connections between the environment, community, industry and economy. DELWP plays an important role in planning for the living corridors and approval of works on Crown land.                                                                                                                                                                                                    |
| VicRoads/ Department of Transport (DoT)                                        | VicRoads is a state Government agency that owns, manages and regulates the arterial road network. VicRoads will be responsible for managing actions on arterial roads within the Living Corridors.                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Registered Aboriginal Parties - Dja Dja Wurrung and the Wathaurong/Wadawurrung | Dja Dja Wurrung territory extends from Mount Franklin and the towns of Creswick and Daylesford in the southeast to Castlemaine, Maldon and Bendigo in the east, Boort in the north, Donald in the northwest, to Navarre Hill and Mount Avoca marking the south west boundary. The traditional boundaries of the Wathaurong people span the coastline from the Werribee River to Lorne peninsula and traverse inland in a north westerly direction towards Ballarat. Dja Dja Wurrungs and Wathaurongs visions have been reviewed as part of the development of the LCAP and will play a pivotal role in the key actions. |
| EPA Victoria (EPA)                                                             | EPA work to prevent and reduce the harmful effect of pollution and waste on Victoria's environment and people. EPA is responsible for administering key environmental legislation within the living corridors in including the E&P Act to reduce pollution and waste.                                                                                                                                                                                                                                                                                                                                                   |

| Stakeholder                | Role/responsibility/interest                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Federation University (FU) | FU facilitates regionally relevant and internationally recognised world-class research activity in a number of key focus areas including conservation and environmental science. FU plays a key role with their knowledge and research capabilities for the LCAP.                                                                                                                       |
| Parks Victoria (PV)        | PV is a statutory authority of the Victorian Government acting in accordance with the <i>Parks Victoria Act 2018</i> . Parks Victoria recognises the value and importance of working in partnership with Traditional Owners to manage parks and reserves in a culturally sensitive and ecologically appropriate way. PV plays a key role in managing parks within the living corridors. |

## 2 Living Corridors

---

The Ballarat Strategy (City of Ballarat 2015) investigates Living Corridors being a concept rather than a particular route. It represents current or potential environmental connections through the landscape, and can give guidance to the ongoing greening of these areas. They are based around existing areas of higher biodiversity values, such as wetlands, bushland reserves and areas for targeted rehabilitation, but also could include recreational trails or major streets and public transport corridors linking neighbourhood centres to each other and the Ballarat central business district. Living corridors offer a high amenity environment, with bike and pedestrian facilities, large canopy trees, resting places and other place-making amenities. Innovative building designs which incorporate garden walls and rooftop gardens (City of Ballarat 2015).

The new 'Living Corridors' network of recreational and biological connections will expand on the highly successful Linear Network of Communal Spaces (LINCS) Strategy (1996) which resulted in the Yarrowee River trail and other key linkages being developed and enjoyed to this day. Although the ecological merit of some living corridors may be relatively low, these corridors will have considerable benefit in improving the liveability of urban areas. The LCAP will provide new opportunities for effective community awareness, education and surveillance (City of Ballarat 2015). It will expand on and bring together current policies and strategies including, local area plans (City of Ballarat 2019a, Tract, City of Ballarat n.d.), masterplans (Yarrowee River) and relevant strategic plans (City of Ballarat 2019b, Parks Victoria 2018).

The living corridors will protect environmentally sensitive areas, provide linkages in the landscape which connect habitat, and potentially act as a buffer between natural and/or human communities. Once identified, change is more easily monitored and opportunities pursued.

As stated in the Ballarat Strategy, to the casual observer, the exact locations of living corridors in 2040 will be unclear. Living corridors won't be marked by a sign, or be clearly delineated on a map. Instead, the experience of urban areas of Ballarat will be of a place which remains connected to its landscape setting. The Living corridors will have brought the biological and rural values of the setting, into the city. Natural features could be loosely connected by blocks of buildings insulated with vegetated roofs.

Rooftop gardens could be providing an increasing proportion of locally sourced food. Ballarat could be a place where urban bee-keeping is the norm, and the urban forest supports the bees to pollinate and support local food security.

Living corridors is a holistic concept to sharpen the focus on how urban and township areas of Ballarat can truly feel like they are part of an urban forest (City of Ballarat 2015).

### 2.1 Ballarat's eastern living corridors

The eastern living corridors of Ballarat are made up of endemic native vegetation, vital waterways and key fauna species which make it a unique and exciting place for a range of people to visit, experience and enjoy. A number of key qualities make up the area some of which include:

- Native flora and fauna
- Vital rivers, creeks and wetlands
- Key urban landscapes

The eastern side of Ballarat currently has extensive areas of native vegetation, centered on Woowookarung Regional Park. Opportunities to enhance connectivity and areas of vegetation to connect from Creswick State Forest / Creswick Regional Park, through to the Scottsburn / Enfield area will be investigated as part of this LCAP. There are gaps in vegetation cover through this area, partly due to roads, including the Ballarat bypass and the Midland Highway. Vegetation removal has continued through this area, mostly due to small to medium sized developments.

The Ballarat area is located on the Midlands (Dissected Uplands) geomorphological area. The region was subject to intense volcanic activity throughout the Pliocene, Pleistocene and into the Holocene periods. The early lava flows resulted in flat plains, and 150 million years ago much of the region would have been a relatively featureless plain. The plain was then lifted and altered by earthquakes occurring in the late Tertiary period (DEPI 2014). Erosion of the uplifted plain over 90 million years has produced the undulating countryside on which the living corridors are located.

Volcanoes, such as Mount Warrenheip to the east of Ballarat, and Mount Buninyong to the South, erupted over the period between 4.5 million and 15,000 years ago, covering the undulating countryside with lava which cooled into basalt. Many of the lava flows followed the course of rivers and creeks, and in the Ballarat and Beaufort areas many rivers were overlain by lava, altering the courses of waterways. (DEPI 2014).

The majority of land along the eastern side of Ballarat has an underlying geology of Ordovician sediments consisting of sandstone, mudstone and black shale, with moderately to well sorted rounded quartz in a matrix of silt or clay (Ocl 1:250,000 Surface Geology Unit – Castlemaine Group – Lancefieldian) (Welch, Higgins, & Callaway 2011). This unit produces soils which are generally low in fertility, when compared with volcanic derived soils, and as a result much of this land was not as extensively cleared for agriculture.

### **2.1.1 Connectivity**

The area supports several large blocks of remnant vegetation, including Woowookarung Regional Park, bushland around Nerrina through to Creswick, Union Jack Education Reserve and Mount Buninyong Scenic Reserve, through to Buninyong. The living corridors are interrupted in some areas by cleared farmland, urban development and major roads, which leads to opportunities for enhancement and improvements in connectivity.

In addition to the north-south 'living corridors', there are also several more local corridors within the area, including the vegetated areas along the Yarrowee River, Gong Gong Creek, Canadian Creek, Main Road, Yankee Flat Road and other minor creeks. These corridors are important for fauna movement, and highly valued by community members for nature-based recreation including walking, cycling and picnicking.

The shared path along the Yarrowee River forms part of the Goldfields Track, which stretches from Mount Buninyong to Bendigo, over a distance of approximately 210 km. This track is also referred to as part of the 'Great Dividing Trail', and the section from Mount Buninyong to Daylesford (including the Brown Hill section), is known as the 'Wallaby Track'. The track is used by walkers, trail runners, cyclists and horse riders and is a great example of a living corridor.



## 3 Community Values

---

### 3.1 Development of the LCAP

The identification of actions and implementation recommendations for the LCAP was determined through a review of existing conditions, a review of background literature, consultation with the Ballarat community and working group meetings.

CoB has worked closely with a wide range of stakeholder groups to advise and form the direction of the LCAP. Consultation has taken place during a range of times and locations to involve a wide range of community members and relevant stakeholders. Currently, one 'community drop-in session' and two working group meetings have been undertaken. Engagement activities have also included the development of the LCAP MySay website.

**Web link:** <https://mysay.ballarat.vic.gov.au/livingcorridors>

The Community Drop in sessions were publicly advertised and open to the entire general public to attend. The working groups were then selected based on an expression of interest application process.

The community consultation sessions have been integral to the development of the vision, goals, and actions of the LCAP. The working group forms the steering committee and includes community members, Department of Environment, Land, Water and Planning, Federation University, Parks Victoria, City of Ballarat, Friends of Canadian Corridor, Catchment Management Authorities, and Country Fire Authority.

#### 3.1.1 Key findings from Community Engagement

During the community consultations sessions and working group meetings concerns were raised about the lack of connection and linkage of native flora to allow for the movement of fauna through these corridors. In order to gain further insight into the community's values and challenges, the following questions were put to the community and working group's members to discuss openly and the following points were raised. These sessions sought to form the basis of determining the key challenges associated with protecting and enhancing the living corridors of Ballarat.

#### What should be included?

- A peri-urban buffer zone which legislatively protects native vegetation in future development including penalties for non-compliance.
- The natural environment should be considered in the greenfields and should influence future Greenfield development.
- Increase the awareness and importance of little creeks.
- Ensure that the corridors include roads and rails.
- Natural elements should be preserved and should influence development outcomes, particularly in larger developments.
- Protection of other species in addition to koalas.

#### How to promote to the wider community?

- Create a code of practice to assist in the influencing behaviours of people and to understand what it means to live in a 'green space' with proximity to natural elements.
- Create a shared responsibility and to understand the value of our natural assets.
- Advocate, campaign and engagement for the project.
- Share the responsibility of the action plan.
- Acknowledge the health and wellbeing aspects & benefits of the project.
- Trigger community interest and provide openings for community action.
- Positively influence human behaviours of those who live in, own land and visit the living corridors.
- Natural elements should be preserved and should influence development outcomes, particularly in larger developments.
- Ensure there is no net reduction of native vegetation across central Ballarat.
- Understand planning considerations.
- Include human behaviours for transporting, commuting.

### **Planning considerations**

- Addressing the conflicting values of the planning overlays, for example Bushfire Management Overlay, Vegetation Protection Overlay and Clause 52.17 Native Vegetation.
- Apply planning controls in a way that will ensure planning decisions to inform good design and conservation of the natural environment.

### **Where are the issues?**

- State policy does not adequately protect native vegetation. More should be done at the local level to raise the bar for the city.
- Lack of connection and linkage of native vegetation for animals and humans to access and move through.
- Feelings of insecurity associated with owning land subject to the Bushfire Management Overlay.
- Specific areas of significant local biodiversity are not being identified, nor is their value documented and shared with the community. This prevents them from becoming treasured and meaningful 'places' within those communities.

### **What are the priorities?**

- Community behaviour and education – ensure they are aware of LCAP and the identified living corridors. It is through sharing such places that people learn to care about living corridors: they become 3D – more than idealised words on a page: they are experienced.
- Clarify why living corridors are needed.
- Community perceptions i.e. current CFA ads creating fear around native vegetation.
- Need for the wider community to value the natural environment.
- Providing local offsets within the corridor.

- Address the degradation of creeks and hold community working bees to establish habitat for platypuses, their food and local fish species so people connect to the landscape and biodiversity.

## **What needs to be done?**

### **Native vegetation**

- Acknowledging the value of trees around health and wellbeing.
- The need to celebrate Ballarat's natural features, not just heritage and built form assets.
- Roadside vegetation protection.
- Encouraging setbacks to allow for plantings.
- Incorporating a tree planting policy which includes indigenous and native trees – explaining why species are chosen, how they are habitat and integrated with fire considerations.
- Increase canopy cover – build on the Urban Forest Action Plan.
- Growing indigenous plants in participants private gardens to increase native flora and fauna to the area.
- Understanding of the implications of getting rid of native vegetation.
- In depth understanding of land fragmentation.
- Measurement and monitoring of tree gain and loss.
- Determine if debris from trees required to be removed for development can be used to provide further habitat for wildlife.

### **Wildlife**

- Focus on all fauna – not just koalas.
- Ensuring that a Kangaroo Cull isn't required in the future. (We have a KPoM – now we need to gather knowledge of the locations of significant areas for particular animals e.g. kangaroo herds, wallaby places, where wedge-tailed eagles live, robins and wrens, honey-eaters, echidnas, platypus, owls, lizards, and so on).
- Determine if a focal species should be featured in LCAP.
- Critical species can be used to engage the community. Bird species could be included.

### **Human health**

- Review and incorporate necessary elements of the 'Living next to a park' document developed in Bendigo.
- Greening of buildings/dwellings as an opportunity.
- Implement shared pathways i.e. walking and cycling.
- Marketing to encourage living in the bush and discourage clearing of vegetation while showing both eyes are open re fire danger and appropriate safe behaviour: e.g. fire plan format for my property to be filled out.

- The implementation of the plan could be volunteer based. This can be acknowledged in the implementation section of the action plan.
- How will human use of the corridor be accommodated?
- Generally acknowledge the human health and wellbeing impacts associated with establishing living corridors.

### Mapping

- A map of existing linkages and trails. Map should show loops and linkages.

### Cultural value

- Understanding cultural values.
- Integration of cultural gardening.
- Address cultural issues – i.e. tensions between the economic value of land and conservation.

### Public Land owners

Understanding the ongoing capacity of Local Government and prevailing attitudes toward environment – the significance of addressing ignorance and negative attitudes in Council employees.

- Potential to include canopy cover legislation in new developments – similar to Ballarat East Local Area Plan.
- Actions that are specific to public or private land.
- Understanding at the impact/inclusion of major arterial roads.
- How will planning for recreational facilities be incorporated in the LCAP?
- Information about the usage of existing pathways (e.g cyclists/walkers/runners/dog walkers.)
- What is the capacity of local governments to enforce compliance in line with LCAP goal?

### Waterways

- Incorporate Water Sensitive Urban Design.
- Integrated Water Management – bring into design.
- Acknowledge waterways (including small creeks).

### Private land owners

- Greening of buildings/dwellings as an opportunity
- Actions that are specific to public or private land.
- Growing indigenous plants in participants private gardens to increase native flora and fauna to the area.
- Understanding of tree canopy in the private space.
- How can council work with developers to create green buildings, limit fragmentation and create linkages within the corridor? How can we encourage people to grasp the value of going up: i.e. living

in more medium level (2-3 story) buildings within shared garden space that invites the natural world in – bringing high quality of life.

- How do we address the issues private landowners have with protecting environmental assets on their properties.

### **Planning considerations**

- Implementing an additional ESO schedule.
- Landscaping requirements i.e. Clause 54 and Clause 55 of the Ballarat Planning Scheme.
- Appropriate dwelling size ratio to land dimensions. Appropriate planning controls to accommodate local biodiversity.

## **3.2 Outcomes**

Following community engagement it was determined that a clear vision and set of goals needed to be developed to address the above community values and concerns. The vision and goals are detailed below.

## 4 Vision and goals

### 4.1.1 Vision

*To support a healthy network of living corridors throughout the east of Ballarat where indigenous flora and fauna thrives and people co-exist, connect and benefit from natural values.*

### 4.1.2 Goals

#### **Goal 1: Increase biodiversity**

- Increase biodiversity and habitat through effective protection, management and rehabilitation of native vegetation, waterways and key public and private urban landscapes.

#### **Goal 2: Urban greening**

- Appropriately increase native vegetation in the context of urban settlement and natural hazard protection.

#### **Goal 3: Shared responsibility**

- Create a shared responsibility between all stakeholders and the broader Ballarat community to realise the value and benefits of natural assets.

#### **Goal 4: Accountability**

- Establish an achievable implementation plan with clear accountability underpinned by robust monitoring and defined measures of success.



## 5 Strategies

Each strategy describes existing conditions, identifies any issues, outlines the objectives, and lists the key actions to be implemented following adoption by City of Ballarat.

### 5.1 Native vegetation

The living corridors includes a range of habitat types, including native vegetation, parklands, and public and private gardens.

Within Victoria, native vegetation is classified into Ecological Vegetation Classes (EVCs) which are identified using a unique number and classification name. These EVCs have been examined as part of the LCAP Background Report (Biosis 2020). Expanding these areas will lead to a diverse and expanded habitat for a range of fauna. Native vegetation within the living corridors is currently made up of common and significant species which have been considered as part of the actions for this LCAP.



**Common species**

Common flora species valued by the community include Austral Grass Tree, the various indigenous eucalypts, Blackwoods, Cherry Ballart and native tussock grasses *Poa* spp. 'Wildflower' species such as Greenhoods, Chocolate Lilly, Common Triggerplant, Trailing Goodenia, Pink-bells, Milkmaids, Common Heath, Purple Coral-pea, Common Hovea and Blue Pincushion are particularly valued.



### Significant species

There are a number of significant species, considered rare or threatened under state and/or commonwealth legislation, that are known to occur, or have potential to occur within the living corridor. These are briefly discussed below.

- Yarra Gum

Yarra Gum *Eucalyptus yarraensis* is listed as rare on DELWP's Advisory List of Rare or Threatened Plants in Victoria (DEPI 2014). It is poorly known, being difficult to distinguish from Swamp Gum *Eucalyptus ovata*, and as a result may be under-reported.

- Wiry Bossiaea

Wiry Bossiaea *Bossiaea cordigera* is listed as rare on DELWP's Advisory List of Rare or Threatened Plants in Victoria (DEPI 2014). It has been recorded within Heathy Dry Forest near Hillview Road.

- Brooker's Gum

Brooker's Gum *Eucalyptus brookeriana* is listed as rare on DELWP's Advisory List of Rare or Threatened Plants in Victoria (DEPI 2014). There is a single record of this species in the eastern portion of the study area, located between Brewery Tap Road and Kirks Reservoir.

### Weeds and threats

Post settlement has brought disruption to the forest functioning, such as tree removal, while also introducing non-native plants and animals. These introductions have often out competed with local plant and animal populations, unbalancing food opportunities and creating new predation threats for animals, such as foxes which impact heavily on local possum and bird populations. Such impacts see a reduction in native habitat, and reduced diversity of animals, disrupting the ecosystems and causing animals to move away and some to disappear (Parks Victoria 2018).

### Cinnamon Fungus

Cinnamon Fungus *Phytophthora cinnamomi* is a soil borne plant root disease that infects susceptible native plants, potentially leading to plant death. It requires moist conditions to spread. It can be transported on wet soil on footwear, bicycle and vehicle tyres. The spread of Cinnamon Fungus begins at a highpoint, i.e. on a hill or start of a water shed, eventually travelling downhill during wet conditions, and in time infects susceptible plants en route. The Austral Grass-tree *Xanthorrhoea australis* is highly susceptible and been affected by the pathogen within Woowookarung Regional Park (Parks Victoria 2018).

Minimising impacts from weeds and diseases and protecting and enhancing native vegetation is vital for the success of the living corridors.

#### **5.1.1 Issues**

- Limited understanding from the wider Ballarat community about the value of native vegetation.
- Clearing of roadside vegetation.
- Minimal setbacks on developments to allow for planting of native vegetation.
- Lacking in depth understanding of land fragmentation from developers, City of Ballarat and the wider Ballarat community.
- Limited measurement and monitoring of tree gain and loss.
- Inappropriate planting of exotic vegetation leading to weedy areas.
- Increased urban developmental pressures.
- Importation of foreign geological and biological material.

#### **5.1.2 Key Objectives**

- Enhance native vegetation within the living corridors.
- Strategically target weed management.
- Enhance the living corridors natural values.
- Improve biodiversity outcomes.

### 5.1.3 Key Actions

**Table 3 Native vegetation actions**

| Action no. /theme | Action description                                                                                                                                                        | Implementation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Outcome        | Priority<br>High (0-2 years)<br>Medium (2-5 years)<br>Low (5 years +)<br>Ongoing | Stakeholders                         |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------------------------------------------|--------------------------------------|
| <b>NV1</b>        | Increase street and park tree planting for the entire living corridors (including native vegetation ground cover).                                                        | <p>City of Ballarat to implement the Street and Park Tree Planting Plan program to consider areas of need: low canopy, heat &amp; social vulnerability.</p> <p>Any street and public area planting plan should identify areas where it would be preferable to establish or enhance indigenous vegetation as opposed to introduced plants.</p> <p>The plan should identify indigenous trees, shrubs, groundcovers and wetland plants appropriate to a particular locale.</p> <p>Every effort should be made to source locally grown plants from locally sourced seed. City of Ballarat officers should consult with ecologists about appropriate plant selection for particular sites.</p> | Goal 1, Goal 2 | High (0 – 2 years)                                                               | City of Ballarat                     |
| <b>NV2</b>        | Partner with schemes (such as 'Gardens for Wildlife Ballarat') to encourage planting selected native species of plants to enhance biodiversity within private properties. | <p>In collaboration with 'Gardens for Wildlife Ballarat' (<a href="https://gardensforwildlifeballarat.org/">https://gardensforwildlifeballarat.org/</a>) undertake a review of the nursery goals and operation model to allow for a model where increased numbers of plants can be provided to the community. Businesses should also be encouraged to develop indigenous gardens on their own premises within the living corridor (whether owned or rented). Advice and plants should be supplied by City of</p>                                                                                                                                                                          | Goal 1, Goal 2 | Low (>5 years)                                                                   | City of Ballarat, Private landowners |

| Action no. /theme | Action description                                                                                                                                                                                                                                              | Implementation                                                                                                                                                                                                                                                                                                          | Outcome                | Priority<br>High (0-2 years)<br>Medium (2-5 years)<br>Low (5 years +)<br>Ongoing | Stakeholders                                                                                   |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
|                   |                                                                                                                                                                                                                                                                 | Ballarat Indigenous Plant Nursery.                                                                                                                                                                                                                                                                                      |                        |                                                                                  |                                                                                                |
| <b>NV3</b>        | Development a Ballarat <i>Living Corridors Weed and Biosecurity Management Plan</i> to identify specific locations for weed control and the implementation of biosecurity measures to control the spread of certain diseases including Cinnamon Fungus dieback. | City of Ballarat to work with Department of Environment, Land, Water and Planning and PV to develop a Weed and Biosecurity Management Plan for the Living Corridors including identifying sites of infection and weed invasion, and measures to limit spread and transmission.                                          | Goal 1, Goal 2         | High (0 – 2 years)                                                               | City of Ballarat, Department of Environment, Land, Water and Planning, Parks Victoria.         |
| <b>NV4</b>        | Promote awareness and understanding in relation to the protection of native trees on private land. Identify areas of trees on privately owned land for protection to help natural regeneration with local community members (on appropriate public land).       | City of Ballarat environment team to organise community information sessions for local landholders on the importance of native vegetation protection and the benefits of this vegetation retention. City of Ballarat to determine an incentive for protecting private trees.                                            | Goal 1, Goal 2, Goal 3 | Medium (2 – 5 years)                                                             | City of Ballarat, private landowners                                                           |
| <b>NV5</b>        | Investigate the use of ecological burning to control weeds and encourage regeneration of native plant species, whilst avoiding hollow-bearing trees and other significant values                                                                                | Consult with CFA and Federation University regarding their Ecological Burn Program. Also seek input from Melbourne (Creswick) University, Parks Victoria, Department of Environment, Land, Water and Planning and traditional land owners regarding developing a planned burn regime for specific areas.eg Woowookarung | Goal 1, Goal 2         | High (0 – 2 years)                                                               | City of Ballarat, Department of Environment, Land, Water and Planning, Parks Victoria, Country |

| Action no. /theme | Action description                                                                                                                                                                                   | Implementation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Outcome | Priority<br>High (0-2 years)<br>Medium (2-5 years)<br>Low (5 years +)<br>Ongoing | Stakeholders                                            |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------------------------------------------------------------------------|---------------------------------------------------------|
|                   |                                                                                                                                                                                                      | Regional Park, Monte Christo, Nerrina, Gong Gong Reservoir Park.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |                                                                                  | Fire Authority, Federation University, Dja Dja Wurrung. |
| <b>NV6</b>        | Facilitate a detailed flora study to determine existing biodiversity values within the living corridors as well as recommendations to link in to adjoining corridors in neighbouring municipalities. | City of Ballarat to fund and facilitate a pilot Flora Study for the Living Corridor in collaboration with adjoining municipalities.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Goal 2  | Medium (2 – 5 years)                                                             | City of Ballarat                                        |
| <b>NV7</b>        | Develop a Revegetation Plan for the Living Corridors with appropriate climate adaptation consideration with species selection.                                                                       | In collaboration with traditional owners, develop a revegetation plan and undertake targeted revegetation on public-managed land. The development of a plan will need significant details and planning with a focus on native vegetation to enhance Koala Habitat, and area east of Kline St. Land for inclusion should include all unused roads in the Warrenheip Bank area, minor roads in the Woodmans Hill area, roads in the Woowookarung Regional Park, Union Jack Reserve, the Whitehorse Ranges including entrances. Rodier St rail corridor, Sandy Banks, Sailors Gully rail corridor, Scott Parade, Richards St between York and Eureka St, Rodier St between Clayton St and Lal Lal St. | Goal 2  | Medium (2 – 5 years)                                                             | City of Ballarat, Traditional owners                    |

## 5.2 Native wildlife

The living corridors supports a range of common and significant native fauna species.

### Common species

Although these species may not be considered rare or threatened, or listed under State or Federal threatened species legislation, they are highly valued by local community members, as they make a significant contribution to the amenity of the area and are an important component of the living corridors.

These include:

- Mammals: Koala, Short-beaked Echidna, Eastern Grey Kangaroo, Black Wallaby, Common Brushtail Possum and Common Ringtail Possum.
- Birds: Crimson Rosella, Laughing Kookaburra, Scarlet Robin, Grey Shrike-thrush, Common Bronzewing, White-winged Chough, White-throated Treecreeper, Tawny Frogmouth and Southern Boobook Owl.
- Frogs: Common Froglet, Southern Tree Frog, Spotted Marsh Frog, Striped Marsh Frog and Pobblebonk Frog.
- Reptiles: Garden Skink and Blue-tongues.

The area also supports a range of more cryptic mammal species that are less known to the general community, including Feathertail Glider, Agile Antechinus and a suite of microbat species.



## Significant species

There are a number of significant fauna species, considered rare or threatened under State and/or Commonwealth legislation, that are known to occur, or have potential to occur within the living corridors. Protecting living corridors are vital to ensure the survival of these species. These are briefly discussed below.

- Brush-tailed Phascogale

There are very few records or sightings of the Brush-tailed Phascogale *Phascogale tapoatafa* in the Ballarat area (Global Biodiversity Information Facility 2019), but the species may be present in low numbers and the area has potential to provide future habitat for this species. The species is listed as Threatened on the *Advisory List of Rare or Threatened Vertebrate Fauna in Victoria* (DSE 2013). It is heavily dependent on Eucalyptus trees for foraging opportunities and tree hollows (Clemann & Gillespie 2012, Mansfield C., Arnold A. H., Bell T. L., York A. 2017).

- Growling Grass Frog

There are several records of Growling Grass Frog *Litoria raniformis* (listed as vulnerable on the EPBC Act) in the Brown Hill area and the nearby Nerrina Wetlands (Atlas of Living Australia 2018). This species occurs in permanently or temporarily inundated water bodies with emergent and submergent aquatic vegetation (Clemann & Gillespie 2012). Its historic range has been severely contracted due to land clearing, agriculture, degraded water quality and altered hydrological regimes.

- Powerful Owl

The Powerful Owl *Ninox strenua* is known to occur within the project area and the broader Ballarat area. This species is a large, wide ranging owl that forages on aboreal mammals, particularly the Common Ringtail Possum. While this species requires large, forested home ranges, it is also known to occur in semi-urban areas where good tree cover persists, including the fringes of major cities within southern Victoria.

- Grey Goshawk

The Grey Goshawk *Accipiter novaehollandiae* is a medium sized raptor that inhabits forests and nearby farmland areas. They are opportunistic hunters, preying on small mammals, birds, reptiles and insects. The species has two forms – the typical grey morph and a pure white morph – both of which are known to occur in low numbers within the Ballarat area. Most recent sightings in around Ballarat have been of the white morph.

### 5.2.1 Issues

- Lack of publicised research and knowledge about movement and populations of native fauna.
- Lack of community knowledge of how to co-habit with native fauna.
- Specific areas of significant local fauna species are not being identified, nor is their value documented and shared with the community. This prevents them from becoming treasured and meaningful 'places' within those communities.
- Clearance of important habitat for native wildlife.
- Decline in fauna populations across the living corridors.
- Overabundance of pest species.

### 5.2.2 Key Objectives

- Increase the protection of native wildlife.
- Preserve populations of locally important wildlife species.

- 
- Reduce threats to native fauna including pest species.
  - Increase the abundance of habitat for native fauna.
  - Increase public awareness of the value and importance of native wildlife and actions to support protection.

### 5.2.3 Key Actions

**Table 4 Native Wildlife Actions**

| Action no. | Action description                                                                                                                                                                                                                                                                                                                                                                     | Implementation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Outcome | Priority<br>High (0-2 years)<br>Medium (2-5 years)<br>Low (5 years +)<br>Ongoing | Responsible Authority                                                 |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| <b>NW1</b> | Utilising Department of Environment, Land, Water and Planning Victorian Biodiversity Atlas Go App, support a citizen science campaign to record indigenous fauna known to have been sighted within specific areas of the living corridors including koalas, kangaroo mobs, wallaby places, wedge-tailed eagles, robins and wrens, honey-eaters, echidnas, platypus, owls, and lizards. | Conduct a local campaign encouraging people to download and use the Department of Environment, Land, Water and Planning Victorian Biodiversity Atlas Go App to record wildlife sightings within the living corridor. This will build a picture of the indigenous flora and fauna within the living corridors and the Ballarat urban area more generally.                                                                                                                                            | Goal 1  | High (0 – 2 years)                                                               | City of Ballarat, Department of Environment, Land, Water and Planning |
| <b>NW2</b> | Conduct a fauna study for the living corridors including fauna surveys to determine fauna movement and abundance and combine with data from NW1 to gain a detailed understanding of fauna patterns within the living corridors.                                                                                                                                                        | Work in collaboration with Federation University or engage an ecologist to conduct a Fauna Study to determine the key species utilising the living corridors. The fauna study will determine: <ul style="list-style-type: none"> <li>Fauna present within living corridors.</li> <li>How to maintain and enhance fauna habitat.</li> <li>Planning controls required to ensure the type, density, design and layout of new development does not have an adverse impact on fauna movements</li> </ul> | Goal 1  | Medium (2 – 5 years)                                                             | City of Ballarat, Federation University                               |

| Action no. | Action description                                                                                                                                                                                                                                        | Implementation                                                                                                                                                                                                                                                    | Outcome        | Priority<br>High (0-2 years)<br>Medium (2-5 years)<br>Low (5 years +)<br>Ongoing | Responsible Authority                                                                                        |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
|            |                                                                                                                                                                                                                                                           | <p>that occur or are likely to occur throughout the living corridors.</p> <ul style="list-style-type: none"> <li>How the protection of fauna within the living corridors can be coordinated with the enhancement and protection of native vegetation.</li> </ul>  |                |                                                                                  |                                                                                                              |
| <b>NW3</b> | Minimise native wildlife road kill by ensuring new roads, water, power lines and other utility easements avoid key linkage areas, or if they must cross key corridors design them to minimise the gaps in connectivity using appropriate fauna crossings. | When designing road projects, consult with experts to create structural passages for wildlife below or above roadways to facilitate the safe movement of wildlife across these roadways. This may be enforced through a Planning Scheme Amendment.                | Goal 1         | High (0 – 2 years)                                                               | VicRoads, City of Ballarat                                                                                   |
| <b>NW4</b> | Develop and roll out an education campaign to encourage owners of domestic animals to keep their domestic pets inside particularly at night, and minimise off leash areas in key conservation areas within the living corridors.                          | City of Ballarat to work with Department of Environment, Land, Water and Planning and PV to develop and distribute brochures and information sessions to communicate the importance of protecting wildlife within the living corridors by securing domestic pets. | Goal 1, Goal 3 | Medium (2 – 5 years)                                                             | City of Ballarat, Department of Environment, Land, Water and Planning, Parks Victoria and private landowners |
| <b>NW5</b> | Facilitate pest management controls procedures to minimise exotic fauna including rabbits and fauna within the living corridors.                                                                                                                          | City of Ballarat to liaise with Department of Precincts, Jobs and Regions to find means to encourage landholder participation in                                                                                                                                  | Goal 1, Goal 3 | Medium (2 – 5 years)                                                             | City of Ballarat, Department of Precincts, Jobs and                                                          |

| Action no. | Action description | Implementation                   | Outcome | Priority<br>High (0-2 years)<br>Medium (2-5 years)<br>Low (5 years +)<br>Ongoing | Responsible Authority   |
|------------|--------------------|----------------------------------|---------|----------------------------------------------------------------------------------|-------------------------|
|            |                    | fox and rabbit control programs. |         |                                                                                  | Regions, Parks Victoria |

## 5.3 Waterways

The landscape along the eastern side of Ballarat is highly dissected by numerous waterways. Three catchments meet to the north of Ballarat, in the Invermay/Nerrina area, where streams flow south into the Barwon catchment, west into the Hopkins Catchment or north into the Loddon Catchment. Most of the eastern side of Ballarat (the eastern corridor), is contained within the upper reaches of the Barwon catchment.

The main waterway flowing through Ballarat is the Yarrowee River, which flows south into the Barwon River. The Canadian Creek flows north, approximately parallel with the Yarrowee, from Mount Helen through to central Ballarat, where it flows into the Yarrowee River just south of the CBD. There are numerous small creeks, mostly ephemeral, which flow into the Canadian creek from higher ground to the east. These creeks generally flow in a westerly or north-westerly direction, many originating in bushland within Woowookarung Regional Park. Land beyond the ridge on the eastern side of Woowookarung Regional Park drains eastward into the Moorabool River, which also flows southward into the Barwon.

Waterways are essential connections between living corridors and protecting and enhancing this vital ecological features will be important for the success of the living corridors.



### 5.3.1 Issues

- Increased sedimentation of waterways due to run-off from unsealed roads
- Lack of community engagement with waterway protection.

- Lack of interpretation and education.
- Degradation of waterways due to urban developmental pressures.
- Poorly designed stormwater arrangements in new developments resulting in increased sedimentation into waterways.
- Degradation of aquatic habitats.
- Reduction in aquatic macroinvertebrates and fauna species as a result of poor waterway health.
- Piping of creeks within the living corridors.
- Missing opportunities to enhance waterways.

### **5.3.2 Key Objectives**

- Regeneration and protection of waterways throughout the living corridors.
- Connected creek line habitats, allowing fauna and flora to transit through the living corridors.
- Recognition that every creek matters and is a natural living corridor.
- Cooler, climate resilient, healthier waterways.
- Capturing opportunities through new developments to improve water condition and water quality.

### 5.3.3 Key Actions

**Table 5 Waterways actions**

| Action no. | Action description                                                                                                                                                                                                                                                                                                                                | Implementation                                                                                                                                                                                                                                                                                                                                                              | Outcome        | Priority<br>High (0-2 years)<br>Medium (2-5 years)<br>Low (5 years +)<br>Ongoing | Responsible authority                                                                 |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>WW1</b> | In collaboration with traditional owners, identify creeks for naming and create signage for connection creeks and key aquatic species along the living corridors. This will help to educate the community about the importance of the little creeks, including connections to rivers and catchments. This should include signage for key species. | City of Ballarat to work with Central Highlands Water, Corangamite Catchment Management Authority and traditional owners to create signage for key waterways.                                                                                                                                                                                                               | Goal 1, Goal 3 | Low (>5 years)                                                                   | City of Ballarat, Central Highlands Water, Corangamite Catchment Management Authority |
| <b>WW2</b> | Review and update the Ballarat Stormwater Management Plan 2010 and the Ballarat Water Sensitive Urban Design (WSUD) Guidelines with a focus of maintaining and improving environmental health.                                                                                                                                                    | City of Ballarat to review the WSUD 2011 to include: <ul style="list-style-type: none"> <li>• A focus on the ecological needs of peri urban creeks with appropriate interface into urban creek design.</li> <li>• Guidelines for how trees and vegetation can be incorporated into WSUD.</li> <li>• Guidelines for how stormwater can be used for tree planting.</li> </ul> | Goal 1, Goal 3 | Medium (2 – 5 years)                                                             | City of Ballarat                                                                      |
| <b>WW3</b> | Prepare a local Water Sensitive Urban Design Policy for inclusion in                                                                                                                                                                                                                                                                              | The revised Ballarat Water Sensitive Urban Design Guidelines will inform a Planning Scheme                                                                                                                                                                                                                                                                                  | Goal 1, Goal 3 | Medium (2 – 5 years)                                                             | City of Ballarat, Central Highlands Water,                                            |

| Action no. | Action description                                                                                                                                                           | Implementation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Outcome | Priority<br>High (0-2 years)<br>Medium (2-5 years)<br>Low (5 years +)<br>Ongoing | Responsible<br>authority                                                                                        |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
|            | the Ballarat Planning Scheme.                                                                                                                                                | Amendment that will introduce a Water Sensitive Urban Design Policy into the Ballarat Planning Scheme.                                                                                                                                                                                                                                                                                                                                                                                                   |         |                                                                                  | Corangamite Catchment Management Authority.                                                                     |
| <b>WW4</b> | Improve environmental flows to create cooler creeks and the management of flows.                                                                                             | Collaborate with Central Highlands Water, Federation University and Corangamite Catchment Management Authority to engage aquatic ecologist to conduct a study on environmental flows in the living corridors. This could focus on Gong Gong and/or White Swan Reservoir and include installation and maintenance of additional litter traps at strategic points along the small and large creek network. The findings should be made public and inform City of Ballarat Local Planning Policy Framework. | Goal 1  | Medium (2 – 5 years)                                                             | City of Ballarat, Federation University                                                                         |
| <b>WW5</b> | Conduct comparison studies on intact waterways when compared with degraded waterways. Look at ways to increase the health of the degraded waterways through this comparison. | Collaborate with Federation University student/s studying Conservation and Land Management or Environmental and Conservation Science in collaboration with WW4 to conduct a study on waterway health in the living corridors.                                                                                                                                                                                                                                                                            | Goal 1  | Medium (2 – 5 years)                                                             | City of Ballarat, Central Highlands Water, Federation University and Corangamite Catchment Management Authority |
| <b>WW6</b> | Conduct a study on sediment loads from roads and relevant infrastructure projects affecting run off into surrounding waterways.                                              | Collaborate with Federation University in collaboration with WW4 and WW5 or engage an aquatic ecologist to conduct a study on the impacts of sediment loads on waterways within the living                                                                                                                                                                                                                                                                                                               | Goal 1  | Medium (2 – 5 years)                                                             | City of Ballarat, Central Highlands Water, VicRoads, and Corangamite                                            |

| Action no. | Action description                                                                      | Implementation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Outcome | Priority<br>High (0-2 years)<br>Medium (2-5 years)<br>Low (5 years +)<br>Ongoing | Responsible authority                                                                                                |
|------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
|            |                                                                                         | corridors. Future road maintenance funding with the City of Ballarat boundaries should allow for an on-going remediation program for old roads. This should focus on the infrastructure construction phase of major subdivisions for example, levelling of the landscape, road construction, diversion of waterways, trenching for services. Introduce greater enforcement and penalties for non-compliance.                                                                                                                                                                                                                                                                                                                                                                                               |         |                                                                                  | Catchment Management Authority                                                                                       |
| <b>WW7</b> | Improve aquatic habitat diversity by creating more wetlands along the living corridors. | <p>Improve aquatic habitat diversity by investigating programs to create wetlands along the living corridor. Collaborate with community groups, Department of Environment, Land, Water and Planning and CCMA.</p> <p>Current policy does not achieve this outcome. The Ballarat Storm Water Management Plan 2010 does not address aquatic diversity in any notable manner. Related to a Planning Considerations, Ballarat Planning Scheme needs a mandated requirement that all retention basins be also wetlands as an equal purpose.</p> <p>The plan currently focuses on flooding only, and therefore inhibits ecological values being considered. Designed with gentle slopes to assist wildlife access to water in lower half (50%) and the top part of pond designed to provide flood retention.</p> | Goal 1  | Medium (2 – 5 years)                                                             | City of Ballarat, Department of Environment, Land, Water And Planning and Corangamite Catchment Management Authority |

| Action no. | Action description                                                                                               | Implementation                                                                                                    | Outcome        | Priority<br>High (0-2 years)<br>Medium (2-5 years)<br>Low (5 years +)<br>Ongoing | Responsible<br>authority                                                                                                               |
|------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>WW8</b> | Ensure that the value of urban waterways is recognised in regional catchment planning and associated resourcing. | Work in collaboration with water authorities to properly integrate such measures into the water catchment policy. | Goal 1, Goal 3 | High (0 – 2 years)                                                               | City of Ballarat,<br>Department of<br>Environment, Land,<br>Water And Planning<br>and Corangamite<br>Catchment<br>Management Authority |

## 5.4 Urban landscape

Much of the eastern corridor contains urban development including residential areas with a range of block sizes. Small areas of industrial land are also present and there are areas of farmland around the fringes of the urban area. Scattered throughout these residential areas are parklands, sports fields, and other areas of public open space. Other green spaces include road reserves and creekside reserves.

Gardens, trees and grasslands within the urban landscape provide habitat for a range of wildlife species. Birds, in particular, are able to make use of residential gardens and parklands, and these areas may in some cases support higher nectar resources than remnant bushland.

There are opportunities for enhancement of natural values within these areas, including:

- Prioritising preservation of existing native trees and remnant vegetation.
- Planting of Australian native species, and particularly locally indigenous species within gardens and public areas.
- Increasing tree and shrub cover within road reserves, and in public open space where this is compatible with other uses.

### 5.4.1 Issues

- Loss of habitat for flora and fauna within urban landscapes.
- Fragmentation within the living corridors created by urban development.
- Removal of vegetation for urban development.
- Lack of understanding within the community

### 5.4.2 Key Objectives

- Minimise fragmentation of urban landscapes within the living corridors.
- Increase native vegetation and places of refuge for native fauna in urban landscapes.
- Gain collaboration from developers to stimulate community interest in supporting living corridors on private land.

### 5.4.3 Key Actions

**Table 6 Urban landscape actions**

| Action no. | Action description                                                                                                                                                                                                                                          | Implementation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Outcome        | Priority<br>High (0-2 years)<br>Medium (2-5 years)<br>Low (5 years +)<br>Ongoing | Responsible Authority                                |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------------------------------------------|------------------------------------------------------|
| <b>UL1</b> | Develop initiatives that support planting on private land and nature strips that reinforce and/or enhance neighbourhood character and strengthen the Urban Forest Action Plan objectives. This includes an increase in native plantings in private gardens. | To enhance NV2, enforce City of Ballarat's 'nature strip policy' and collaborate with ' <i>Ballarat Gardens for Wildlife</i> ' to increase community awareness of the importance of indigenous gardens on private land to connect living corridors and provide refuge for native fauna. Seek partnerships or sponsorships with Ballarat businesses for specific biodiversity habitat projects in the living corridors.<br>Businesses should also be encouraged to develop indigenous gardens on their own premises (whether owned or rented).<br>Advice and plants could be supplied by City of Ballarat Indigenous Plant Nursery. | Goal 1, Goal 3 | Ongoing                                                                          | City of Ballarat, private landowners, and developers |
| <b>UL2</b> | Develop an urban greening plan to inform regeneration plan: street and park trees, green walls, green roofs, pocket parks, increased permeability with consideration of fire risk.                                                                          | To build on the Urban Forrest Action Plan, urban greening plans could be developed for every suburb. Priority areas such as Wendouree and Sebastopol with low existing tree cover should be identified. City of Ballarat to integrate into asset renewal and capital works projects and 10-year planting program.                                                                                                                                                                                                                                                                                                                  | Goal 2         | Medium (2 – 5 years)                                                             | City of Ballarat                                     |

| Action no. | Action description                                                                                                                                                                                                                   | Implementation                                                                                                                                                                                                                                                                                                                           | Outcome                | Priority<br>High (0-2 years)<br>Medium (2-5 years)<br>Low (5 years +)<br>Ongoing | Responsible Authority                                                                     |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <b>UL3</b> | Related to action WW2, seek to encourage the innovative use of stormwater for planting, particularly in highly urbanised locations including for trees, and gardens beds containing indigenous shrubs and groundcovers.              | Following the review of WSUD, effectively manage the use of stormwater for planting, particularly in highly urbanised locations including for trees, and gardens beds containing indigenous shrubs and groundcovers.                                                                                                                     | Goal 1, Goal 3         | High (0 – 2 years)                                                               | City of Ballarat                                                                          |
| <b>UL4</b> | Identify and manage contaminated land legacy sites. Develop a strategy to manage the sites and contaminated sediment loads.                                                                                                          | Collaborate with the Environment Protection Authority to manage the sites and contaminated sediment loads. Develop an action plan for dealing with contaminated sediment loads within the living corridors.                                                                                                                              | Goal 1                 | Medium (2 – 5 years)                                                             | City of Ballarat, Environment Protection Authority                                        |
| <b>UL5</b> | Explore the use of Citizen Science in acquiring and reporting on biodiversity data for urban areas of Ballarat.                                                                                                                      | To enhance NW1, with a focus on urban areas, commence a local campaign encouraging people to download and use Department of Environment, Land, Water and Planning VBA Go App to record wildlife sightings in urban areas would be beneficial to building up a picture of the indigenous flora and fauna within the Ballarat urban areas. | Goal 1, Goal 2, Goal 3 | Medium (2 – 5 years)                                                             | City of Ballarat, Department of Environment, Land, Water and Planning, private landowners |
| <b>UL6</b> | Future subdivision of large blocks within the living corridors should be planned to maximise connectivity by increasing landscaping of private native gardens and minimise fragmentation of land with existing natural values (in an | Require new developments to provide generous front and back garden areas and setbacks to accommodate quality small to medium sized trees. This will need to be done through an amendment to the planning scheme for subdivision within ESO or VPO to have landscaping requirements.                                                      | Goal 2                 | High (0 – 2 years)                                                               | City of Ballarat and Developers.                                                          |

| Action no. | Action description                                                                                                                                        | Implementation | Outcome | Priority<br>High (0-2 years)<br>Medium (2-5 years)<br>Low (5 years +)<br>Ongoing | Responsible Authority |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------|----------------------------------------------------------------------------------|-----------------------|
|            | Environmental Significance Overlay [ESO] or a Vegetation Protection Overlay [VPO]) or strategically located with the potential for future rehabilitation. |                |         |                                                                                  |                       |

## 5.5 Climate change and bushfire

The protection and adaptation of the living corridors to climate change and bushfire will continue to be important to ensure the sustainable use of the corridor for people and nature alike. The Ballarat Strategy discusses how Climate change is likely to impact on the Ballarat community over the coming decades. There are expected changes in the intensity and frequency of extreme weather events, changes to the water cycle affecting agriculture and other key industries, and concerns about the ongoing threat of natural disasters such as bushfires and floods.

In terms of a growing population, the impact of such changes can have increasingly significant impacts. City of Ballarat's response to the challenges of climate change are embedded throughout all sections of the Ballarat Strategy.

The approach is fundamentally about reducing City of Ballarat's contribution to greenhouse gas emissions and adapting to a changing climate. But it is far more complex than that. All component of City of Ballarat business will need to play an important role and the Living Corridors will form a vital part.

### 5.5.1 Issues

- Loss of key fauna and fauna species as a result of impacts from climate change including bushfire.
- Climate risk may also lead to reduced, or more variable water quality in catchments and environmental waterways, including incidences of blue green algal blooms, water-borne diseases and ash contamination from more frequent extreme events such as bushfires, floods and droughts. This can have implications for natural systems.
- Increase in temperature and extreme weather events such as flash flooding are key factors affecting the distribution of plants and animals. These have diverse implications with habitats expanding, contracting or changing in response to the changing climate.
- Change in the timing of seasonal events, such as arrival of birds and butterflies.
- Climate change may impact the flowering of plants, impacting on the viability of certain species.
- Climate change can exacerbate existing pressures facing habitat and populations that currently persist in fragmented landscapes and depleted condition.
- Climate change may expand existing risk presented by pests, invasive species and diseases or make Victoria vulnerable to further infestations. In addition, extreme weather events such as floods, droughts and fires are likely to result in increased weed coverage at the expense of native vegetation.

### 5.5.2 Key Objectives

- Assist in climate proofing creeks.
- Minimise the impact of the Ballarat area to climate change.
- Adapt to the changing environment.
- Minimise risk to human life from bushfire.
- Minimise the need to clear vegetation for fire risk within the living corridors.

### 5.5.3 Key actions

**Table 7 Climate change and bushfire actions**

| Action no.  | Action description                                                                                          | Implementation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Outcome | Priority<br>High (0-2<br>years)<br>Medium (2-5<br>years)<br>Low (5 years<br>+)<br>Ongoing | Responsible Authority |
|-------------|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------------------------------------------------|-----------------------|
| <b>CCB1</b> | Embed bushfire considerations into strategic planning projects.                                             | Prepare a Strategic landscape bushfire study for City of Ballarat to be considered when preparing Planning Scheme Amendments. Bushfire considerations will be embedded in the early stages of strategic planning projects which will reduce the likelihood of delays associated with providing strategic justification to support amendments.                                                                                                                                                                                                                                                                                                                              | Goal 3  | High (0 – 2 years)                                                                        | City of Ballarat      |
| <b>CCB2</b> | Direct population growth and development to low risk locations away from Bushfire Management Overlay (BMO). | As per the BMO, ensure settlement growth and development approvals can implement bushfire protection measures without unacceptable biodiversity impacts by discouraging settlement growth and development in bushfire affected areas that are important areas of biodiversity. This will need to be done through an amendment to the planning scheme.<br>Bushfire risk associated with propose Planning Scheme Amendments will be addressed prior to seeking authorisation from the Minister of Planning. Future Planning Scheme Amendments will not facilitate population growth and development in areas with important biodiversity that are also affected by bushfire. | Goal 3  | High (0 – 2 years)                                                                        | City of Ballarat      |
| <b>CCB3</b> | Update and adopt Ballarat's planting species list to account                                                | City of Ballarat to prepare a municipal wide recommended indigenous tree planting list. The list will give consideration to climate change, viability in Ballarat's climate and will be integrated with bushfire                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Goal 2  | Medium (2 – 5 years)                                                                      | City of Ballarat      |

| Action no.  | Action description                                                                                                                                                                                       | Implementation                                                                                                                                                                                                                                                                                                                                                                                                        | Outcome        | Priority<br>High (0-2<br>years)<br>Medium (2-5<br>years)<br>Low (5 years<br>+)<br>Ongoing | Responsible Authority |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------------------------------------------------------------------------------|-----------------------|
|             | for resilience to climate change, viability in Ballarat's climate and integrated with fire considerations.                                                                                               | considerations. A loose definition of "indigenous" encompasses plants growing within a 40 km radius. City of Ballarat may need to go outside the local area to find native plants suitable under changing climatic conditions<br><a href="https://www.ballarat.vic.gov.au/city/parks-and-outdoors/indigenous-plants">https://www.ballarat.vic.gov.au/city/parks-and-outdoors/indigenous-plants</a> could be expanded. |                |                                                                                           |                       |
| <b>CCB4</b> | Correctly enforce the BMO and Clause 13.02, including directing population growth away from high risk areas and ensuring native vegetation is not removed as a result of development in high risk areas. | Conduct training sessions for City of Ballarat Statutory Planning Department on BMO to ensure it is managed correctly. The Planning Scheme BMO does not require, nor endorse the removal of existing native vegetation to make way for new dwellings.                                                                                                                                                                 | Goal 2         | High (0 – 2 years)                                                                        | City of Ballarat      |
| <b>CCB5</b> | Enforce the objectives of the BMO for bushfire protection but not at the expense of biodiversity.                                                                                                        | Conduct retraining sessions for Statutory Planning Department on BMO ensure development is only permitted where the risk to life and property from bushfire can be reduced to an acceptable level. The Planning Scheme BMO does not require, nor endorse the removal of existing native vegetation to make way for new dwellings.                                                                                     | Goal 1, Goal 2 | Low (>5 years)                                                                            | City of Ballarat      |

## 5.6 Community awareness and involvement

Providing the Ballarat community with information regarding the on-going maintenance and planning of the living corridors to foster community understanding and commitment to caring for Living Corridors.

Furthermore, consulting the public on proposed planned works for the living corridors will enable the City of Ballarat to create living corridors which adheres to community interests and expectations.

### 5.6.1 Issues

- Lack of awareness of the importance of the living corridors from the wider Ballarat community.
- Fragmentation in usable spaces for community enjoyment due to increase urban development.
- Lack of connection of the broader Ballarat community of the value of the natural environment.
- Reduction in the number of volunteers engaged with community events.

### 5.6.2 Key Objectives

- Greater community ownership for the protection of native vegetation.
- Increased community appreciation of native flora and fauna.
- Greater community ownership of natural features due to naming of key natural features.
- Increased community involvement at volunteer and community days.



### 5.6.3 Key Actions

**Table 8 Community Awareness and Involvement actions**

| Action no.   | Action description                                                                                                                                                                                                                                                           | Implementation                                                                                                                                                                                                                                                                                 | Outcome                | Priority<br>High (0-2 years)<br>Medium (2-5 years)<br>Low (5 years +)<br>Ongoing | Responsible Authority                           |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------|-------------------------------------------------|
| <b>CAI 1</b> | Establish and/or continue community planting days at revegetation sites in the identified living corridors. Support schools, aged care agencies, community groups, and local allied health groups by providing plants for plantings that will improve biodiversity outcomes. | Organise community volunteer days with schools, aged care agencies, community groups, and local allied health groups. City of Ballarat to undertake a review of the nursery goals and operation model to allow for a model where increased numbers of plants can be provided to the community. | Goal 2, Goal 3         | Ongoing                                                                          | City of Ballarat, Friends of/ community groups. |
| <b>CAI 2</b> | Organise community information days on native flora and fauna within the living corridors and include a workshop to build habitat for fauna including bird boxes.                                                                                                            | City of Ballarat to facilitate and organise community information days on native flora and fauna in the living corridor and including setting up a workshop to build habitat for fauna including bird boxes.                                                                                   | Goal 1, Goal 2, Goal 3 | Ongoing                                                                          | City of Ballarat, Friends of/ community groups. |
| <b>CAI 3</b> | Run a community awareness campaign for resident programs working on waterways such as 'Nature Stewards'.                                                                                                                                                                     | City of Ballarat to support sessions by budget allocation for waterway and habitat education. City of Ballarat dedicated staff working with, and resourcing, Friends Groups and Landcare                                                                                                       | Goal 1, Goal 3         | Medium (2 – 5 years)                                                             | City of Ballarat, Friends of/ community groups. |

| Action no.   | Action description                                                                                                                                    | Implementation                                                                                                                                                                                                                                                        | Outcome | Priority<br>High (0-2 years)<br>Medium (2-5 years)<br>Low (5 years +)<br>Ongoing | Responsible<br>Authority                        |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------------------------------------------------------------------------|-------------------------------------------------|
|              |                                                                                                                                                       | Groups including 'Nature Stewards'. Natures Stewards is a program that should be central to building the community's understanding of environmental stewardship in the Living Corridor area.                                                                          |         |                                                                                  |                                                 |
| <b>CAI 4</b> | Control weeds along river/creeks banks and in priority bushland areas. Identify areas of concern and determine focus areas to have weed removal days. | City of Ballarat to facilitate a weed management plan and to implement this, City of Ballarat to facilitate volunteer days to work with community groups including 'Friends' or 'Landcare Groups'.                                                                    | Goal 2  | High (0 – 2 years)                                                               | City of Ballarat, Friends of/ community groups. |
| <b>CAI 5</b> | Advertise the LCAP with information pamphlets and include a section on the human health benefits.                                                     | Advertise the LCAP with information pamphlets and include a section on the human health benefits. Make the information part of the new residents information package. Make the information available through the City of Ballarat website and social media platforms. | Goal 3  | Medium (2 – 5 years)                                                             | City of Ballarat                                |

## 5.7 Planning considerations

There is key legislation and policy that are relevant to protection and management of the living corridors at Commonwealth, State and local levels. In order to implement and govern change a variety of actions have been developed to be incorporated into planning legislation, particularly into the Ballarat Planning Scheme.

### 5.7.1 Issues

- Enforcing regulations to protect vegetation and respond to illegal vegetation removal.
- Conflicting values of the planning overlays including the VPO, ESO and BMO.
- Community concern associated with owning land subject to the BMO.
- Ensure that planning controls are appropriate, effective and achieve desired outcomes.

### 5.7.2 Key Objectives

- Minimise red tape and remove requirements that add no value in the planning system.
- Apply planning controls to ensure planning decisions support and protect the natural environment.
- Address conflicting values of the planning overlays including the VPO, ESO and BMO.



### 5.7.3 Key Actions

**Table 9 Planning actions**

| Action no. | Action description                                                                                                                                                                                                                              | Implementation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Outcome | Priority<br>High (0-2 years)<br>Medium (2-5 years)<br>Low (5 years +)<br>Ongoing | Responsible Authority |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------------------------------------------------------------------------|-----------------------|
| <b>PC1</b> | Conduct a detailed analysis on the effectiveness of the current ESO to confirm it's accurately protecting the living corridors, particularly ESO5 and koala populations.                                                                        | Conduct a detailed analysis on the effectiveness of the current ESO based on an ecological survey. Amend the Schedule 5 to the Environmental Significance Overlay (ESO5) in accordance with ESO5 review.                                                                                                                                                                                                                                                                                                                            | Goal 2  | High (0 – 2 years)                                                               | City of Ballarat      |
| <b>PC2</b> | Update the Vegetation Protection Overlay to accurately delineate the current extent of remnant indigenous vegetation.                                                                                                                           | Commence a review of the VPO1 ordinance and mapping. Engage an ecologist to accurately map current extent of the VPO1.                                                                                                                                                                                                                                                                                                                                                                                                              | Goal 2  | High (0 – 2 years)                                                               | City of Ballarat      |
| <b>PC3</b> | Prepare Native Vegetation Precinct Plans (NVPP) as part of Local area planning to identify vegetation that can be removed and vegetation to be retained. The NVPP should also document mitigation measures for native vegetation to be removed. | <p>The Native Vegetation Precinct Plans should be incorporated into the relevant Local Area Plans and include:</p> <ul style="list-style-type: none"> <li>• Identify the precinct</li> <li>• Identify which native vegetation may be removed</li> <li>• Identify which native vegetation must be retained</li> <li>• Describe the type and amount of vegetation loss that must be offset</li> <li>• Identify the type and location of offsets to be provided</li> <li>• Include a timeframe for implementing the offsets</li> </ul> | Goal 2  | High (0 – 2 years)                                                               | City of Ballarat      |

| Action no. | Action description                                                                                                                                                                                                                                                                      | Implementation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Outcome           | Priority<br>High (0-2 years)<br>Medium (2-5 years)<br>Low (5 years +)<br>Ongoing | Responsible Authority |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------------------------------------------------------------------------|-----------------------|
|            |                                                                                                                                                                                                                                                                                         | <p>The Planning Scheme Amendment will result in the following changes to the Ballarat Planning Scheme:</p> <ul style="list-style-type: none"> <li>• Incorporate the Native Vegetation Precinct Plan into Clause 52.16 of the Ballarat Planning Scheme.</li> <li>• Requirement a planning permit to remove, destroy or lop native vegetation unless the native vegetation removal is in accordance with an NVPP.</li> </ul> <p>These could be developed and established initially into the Ballarat East Local Area Plan.</p> |                   |                                                                                  |                       |
| <b>PC4</b> | Review Clause 22 Local Planning Policies to support the vision and goals of the LCAP.                                                                                                                                                                                                   | Amend Local Planning Policies to support the vision and goals of the LCAP                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Goal 2            | High (0 – 2 years)                                                               | City of Ballarat      |
| <b>PC5</b> | Enforce permeable fencing crossing creek links on private and public land to allow the movement of fauna through the corridor. Permeable fencing be considered in areas within buffer/proximity areas close to reserves and vegetated patches that provide habitat-dispersal potential. | <p>This requirement could be built into the planning scheme such as an amendment to ESO5.</p> <ul style="list-style-type: none"> <li>• City of Ballarat Planning Scheme mandating transparent fencing along creek faces.</li> <li>• Encourage innovative wildlife friendly fence design. For example, fencing facing Scentbark Lane in Canadian is an exemplar in required transparency.</li> </ul>                                                                                                                          | Gaol 1 and Goal 3 | High (0 – 2 years)                                                               | City of Ballarat      |
| <b>PC6</b> | Enforce the objectives of the BMO for bushfire protection but not at the expense of                                                                                                                                                                                                     | Conduct retraining sessions for Statutory Planning Department on BMO ensure development is only                                                                                                                                                                                                                                                                                                                                                                                                                              | Goal 1            | High (0 – 2 years)                                                               | City of Ballarat      |

| Action no. | Action description | Implementation                                                                                                                                                                                                                    | Outcome | Priority<br>High (0-2 years)<br>Medium (2-5 years)<br>Low (5 years +)<br>Ongoing | Responsible Authority |
|------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------------------------------------------------------------------------|-----------------------|
|            | biodiversity.      | permitted where the risk to life and property from bushfire can be reduced to an acceptable level. The Planning Scheme BMO does not require, nor endorse the removal of existing native vegetation to make way for new dwellings. |         |                                                                                  |                       |

## 5.8 Measures of success

The monitoring of success requires an understanding of environmental indicators as well as social reception. This includes indicators such as native vegetation loss/ gain rates as well as the community's attitudes towards how the actions are being implemented at a real world scale. The indicators will be measureable to ensure appropriate monitoring can occur as well as agile to allow for refinement where and when required.

Regular monitoring of the implementation of the LCAP is required to ensure that progress is made, recommendations remain relevant, priorities are addressed, and management approaches and decisions remain consistent with the vision and principles set out in the LCAP. Monitoring, evaluation and reporting are key to measuring success.

### 5.8.1 Issues

- Recognising which actions have/have not been implemented from the LCAP
- Consistency in collating data and reporting on the implementation of the LCAP
- Understanding how to communicate with relevant stakeholders and the wider community on the progress of the LCAP during the implementation process.

### 5.8.2 Key Objectives

- Create an achievable monitoring program which enables the City of Ballarat to ensure key objectives of the LCAP are being met, actions are being implemented and to provide clear and interpretable information on what changes are occurring.
- Determine the effectiveness of actions in meeting the LCAP vision and goals and objectives.



**Table 10 Implementation of measuring success of the LCAP**

| Action no. | Action description                                                                                                                                                                                                               | Outcome                        | Priority<br>High (0-2 years)<br>Medium (2-5 years)<br>Low (5 years +)<br>Ongoing<br>Medium Priority (2- 5 years) | Responsible authority                                                                                   |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| <b>MS1</b> | Undertake an annual review of the delivery of actions through a council review process to track the implementation of the LCAP.                                                                                                  | Goal 1, Goal 2, Goal 3, Goal 4 | Ongoing                                                                                                          | City of Ballarat                                                                                        |
| <b>MS2</b> | Undertake surveys of key fauna within the Living Corridors at the beginning of the implementation process of the LCAP and one year into implementation.                                                                          | Goal 1, Goal 2                 | Ongoing                                                                                                          | City of Ballarat, Department of Environment, Land, Water and Planning, Parks Victoria, Community Groups |
| <b>MS3</b> | Undertake flora surveys using aerial imagery (potentially using drones) to determine growth of flora with this the living corridors at the beginning of the implementation process of the LCAP and one year into implementation. | Goal 1                         | Ongoing                                                                                                          | City of Ballarat, Department of Environment, Land, Water and Planning, Parks Victoria, Community Groups |
| <b>MS4</b> | Provide annual report to key stakeholders and community members on the implementation of the actions listed in the LCAP as well as request a report from key stakeholders on their actions                                       | Goal 4                         | Ongoing                                                                                                          | City of Ballarat                                                                                        |

|            |                                                                                                                                       |                                |         |                  |
|------------|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------|------------------|
| <b>MS5</b> | Review the LCAPs eastern boundary to determine if the LCAP could expanded further west of Ballarat following the success if the LCAP. | Goal 1, Goal 2, Goal 3, Goal 4 | Ongoing | City of Ballarat |
|------------|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------|------------------|



## 6 References

---

- Aurecon, City of Ballarat 2015. *Woodmans Hill Gateway Precinct Master Plan*, Ballarat, Victoria.
- Ballarat City Integrated Water Management Plan, 2018., Ballarat, Victoria.
- Biosis 2020. *Living Corridors Action Plan: Background Report*, Biosis Pty Ltd, Melbourne, Victoria.
- City of Ballarat 2010. *Stormwater Management Plan*, Ballarat, Victoria.
- City of Ballarat 2015. *The Ballarat Strategy*, City of Ballarat, Ballarat, Victoria.
- City of Ballarat 2016. *Nature Strip Policy*, City of Ballarat, Ballarat, Victoria.
- City of Ballarat 2017. *Ballarat Cycling Action Plan*, City of Ballarat, Ballarat, Victoria.
- City of Ballarat 2019a. *Ballarat East Local Area Plan*, Ballarat, Victoria.
- City of Ballarat 2019b. *Urban Forest Action Plan*, City of Ballarat, Ballarat, Victoria.
- City of Ballarat n.d. *Living with Koalas*, City of Ballarat, Ballarat, Victoria.
- Clemann N & Gillespie GR 2012. National Recovery Plan for the Southern Bell Frog *Litoria raniformis*, Victorian Government Department of Sustainability and Environment. Melbourne, Victoria.
- Commonwealth of Australia 2009. *Australia's Biodiversity Conservation Strategy 2010–2020*, Department of the Environment, Water, Heritage and the Arts.
- DELWP 2017. Protecting Victoria's Environment - Biodiversity 2037, Victorian Government Department of Environment, Land, Water and Planning. Melbourne.
- DEPI 2014. *Advisory List of Rare or Threatened Plants in Victoria - 2014*, Victorian Government Department of Environment and Primary Industries. East Melbourne, Victoria.
- DSE 2013. *Advisory List of Threatened Vertebrate Fauna in Victoria – 2013*, Victorian Government Department of Sustainability and Environment. Melbourne, Victoria.
- Global Biodiversity Information Facility 2019. *Atlas of Living Australia - Species*, *Atlas of Living Australia*, [http://biocache.ala.org.au/explore/your-area#-35.852755439790656|141.88285447714838|11|ALL\\_SPECIES](http://biocache.ala.org.au/explore/your-area#-35.852755439790656|141.88285447714838|11|ALL_SPECIES).
- Living Next to Nature*, 2016., Victorian National Parks Association supported by City of Bendigo, Bendigo, Victoria.
- Mansfield C., Arnold A. H., Bell T. L., York A. 2017. *Habitat characteristics of a threatened arboreal marsupial and its resource use in a degraded landscape: the brush-tailed phascogale (Phascogale tapoatafa tapoatafa) in central Victoria, Australia.*, Wildlife Research.
- Parks Victoria 2018. *Woowookarung Regional Park Strategic Directions Plan*, Melbourne, Victoria.

Tract, City of Ballarat n.d. *Brown Hill Local Area Plan & Infrastructure Assessment Background Paper*, Prepared for City of Ballarat. Authors: Paroissien Grant and Associates, Biosis, Max Hardy, Essential Economics, and One Mile Grid.

Victorian Government 2014. *Central Highlands Regional Growth Plan*, Victorian Government, Melbourne, Victoria.

Welch S, Higgins D, & Callaway G (eds) 2011. *Surface Geology of Victoria 1:250000*, Geological Survey of Victoria, Department of Primary Industries.