

**Yarrowee River and Tributaries**  
River Corridor Masterplan  
City of Ballarat

THOMSON HAY LANDSCAPE ARCHITECTS  
in collaboration with Roger Thomas

July 2020

THOMSON HAY  
LANDSCAPE ARCHITECTS

## Acknowledgement of Country

We respectfully acknowledge the Wadawurrung people, the traditional custodians of the land in which the Yarrowee River and tributaries flow. We recognise our continuing responsibility to care for country at these sites. We pay our respects to Elders past, present, and future and acknowledge their spiritual connection to Country.

## Lead Organisation

City of Ballarat



## Funding Partner Organisations

Central Highlands Water  
Department of Environment, Land Water and Planning



## Stakeholder and Community Engagement

Stakeholder and community engagement was an important part of this project. We would like to thank the following groups and the individual community members for their contribution to our project:

Bunanyung Landscape Alliance  
Leigh Catchment Group  
Friends of Canadian Corridor  
Ballarat Environment Network  
Castlemaine Goldfields Pty Ltd (Ballarat Gold Mine)  
Federation University

### Glossary / Abbreviations

BEN Ballarat Environment Network  
CHW Central Highlands Water  
COB City of Ballarat  
CCMA Corangamite Catchment Management Authority  
DELWP Department of Land Water and Planning  
EVC Ecological Vegetation Class  
Fed Uni Federation University  
THLA Thomson Hay Landscape Architects  
WSUD Water Sensitive Urban Design  
WRP Woowookarung Regional Park

### Note

Outlined text provides hyperlinks to further information. Please use the PDF version to access these links.

The following organisations and individuals have guided, reviewed, contributed and commented on this report:

## City of Ballarat

### City Design

- John Dyke, Project Coordinator
- Adam Parrott, Senior Landscape Architect
- 

### Parks & Gardens

- Daryl Wallis, Coordinator Parks and Gardens
- David Keighrey, Supervisor Parks Maintenance
- Ken Cox, Supervisor Trails and Waterways
- Daniel Siemensma, Vegetation Planning and Management Officer

### Strategic Planning

- Vanessa O'Shea, Strategic Planner

### Engaged Communities

- Pete Appleton, Executive Manager
- Jenny Sheriff, Community Development Officer

### Community Development

- Nikki Foy, Aboriginal Cultural Liaison Officer

### Recreation

- Michael Hynes, Senior Advisor – Strategy & Planning

## Central Highlands Water

Peter Field, Senior Planner Catchments and Partnerships

## Corangamite CMA

Sarah Holland-Clift, General Manager Community and Catchment Services

## DELWP

Emily Lee, Planning and Approvals Program Officer

## Project Design Team

This project was led by Thomson Hay Landscape Architects in collaboration with Roger Thomas

David Hay - Registered Landscape Architect  
Heidi Mikulic - Registered Landscape Architect  
Roger Thomas - Naturalist consultant  
Claire Reynolds - Registered Landscape Architect  
Georgia Carroll - Landscape Architect

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Aerial view of the Yarrowee River near CHW wastewater treatment ponds

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# Executive Summary

## The future of Ballarat's waterways

### Background

In 1995, a Landscape Master Plan & Management Plan was developed for the Yarrowee River Corridor and has formed the strategic basis for the restoration of the waterway over the last 25 years. The approaching anniversary of this document prompted the review and update of the Yarrowee Masterplan to guide new works and priorities for the next 20 years.

Ballarat and the Yarrowee River are facing a new and different set of challenges and changes since the previous plan, including significant residential development, population increase and the impacts of climate change such as the projected increase in stormwater flows. This masterplan supports existing City of Ballarat and greater catchment strategic documents to propose the new strategic foundation to improve, develop, manage and maintain the Yarrowee River and tributaries.

This project covers 38km of the Yarrowee River - from the Gong Gong Reservoir to the City of Ballarat's southern boundary (near Garibaldi) - and over 35km of tributary creeks that flow into the Yarrowee. The report provides recommendations for both the waterways and adjacent reserve land.

### Project Partners

This project is a collaborative initiative between City of Ballarat, Peak Stakeholder Bodies, community members and joint funding partner organisations; Central Highlands Water and Department of Environment, Land, Water and Planning.

### Project Objectives

This project aims to:

- Assess recommendations of the previous report to review priorities, works undertaken (including evaluation of successful outcomes) and provide priorities for future development, management and maintenance.
- Identify areas along the waterways with limited access and poor connections, river and vegetation degradation and other low quality / amenity areas to provide solutions to improve river corridor environment both for ecological and social benefits.
- Provide recommendations to develop and manage the river and creek corridors to increase Ballarat's liveability and boost the economic, environmental and health benefits of the waterways.
- Develop a guide for council staff to prioritise ongoing maintenance and future works including funding allocation.

### Project Process & Consultation

The initial stage of this project involved extensive analysis of the existing conditions of the waterways, including a review of the works undertaken as part of the previous plan. Site visits and analysis were completed over the full extent of the Yarrowee River and tributaries, walking and cycling accessible sections, where possible and capture of aerial video footage using a drone in inaccessible areas for a desktop analysis review.

A Project Working Group was established and key stakeholders were consulted at various stages of the project. An online survey was developed for the Ballarat community for comment on the future of the waterways. The community input has been carefully considered and integrated into recommendations and proposals along the waterways.

The expansion of key recommendations for the action plan and the outcomes for the masterplans were developed from the analysis and consultation process. Key projects were presented and the City of Ballarat and the Project Working Group chose four Priority Projects for further design development and detailed costing.

### Dovetailing with City of Ballarat Strategic Direction and Policy

This report aligns with multiple, ongoing CoB strategic documents and builds on works recommended surrounding the waterways. Proposals ties with the principles set out in the Ballarat Strategy (2015) and other documents including the Urban Forest Action Plan, Greening Ballarat (a green-blue action plan) and the Ballarat City Integrated Water Management Plan to continue the vision of *A Greener More Vibrant and Connected Ballarat*

### Action Plan

This report includes a detailed Action Plan with recommendations and priorities developed with CoB to suit their ongoing strategic vision for Ballarat and supporting strategies. The recommendations cover 8 themes:

- Access and Trails
- Rehabilitation, Revegetation and Vegetation Management
- Water Quality and Wetlands
- Sludge and Contaminated Sites
- Recreation and Parks
- Land Tenure and Future Land Development
- Community Engagement and Education
- Sustainable Management of Waterways

The action plan is to be used as a guide for resourcing and funding decisions over the next 20 years

### Masterplan

The Yarrowee River and Tributaries River Corridor Masterplan includes a set of 34 plans spanning the River and Tributaries. The maps have been divided into 5 reaches, north, central, south, rural and tributaries. They include site-specific proposals for the waterways and reserve land including trails and links, revegetation, areas for future development and key features such as trail heads, wetlands, wayfinding signage, carparks and more.

### Priority Projects

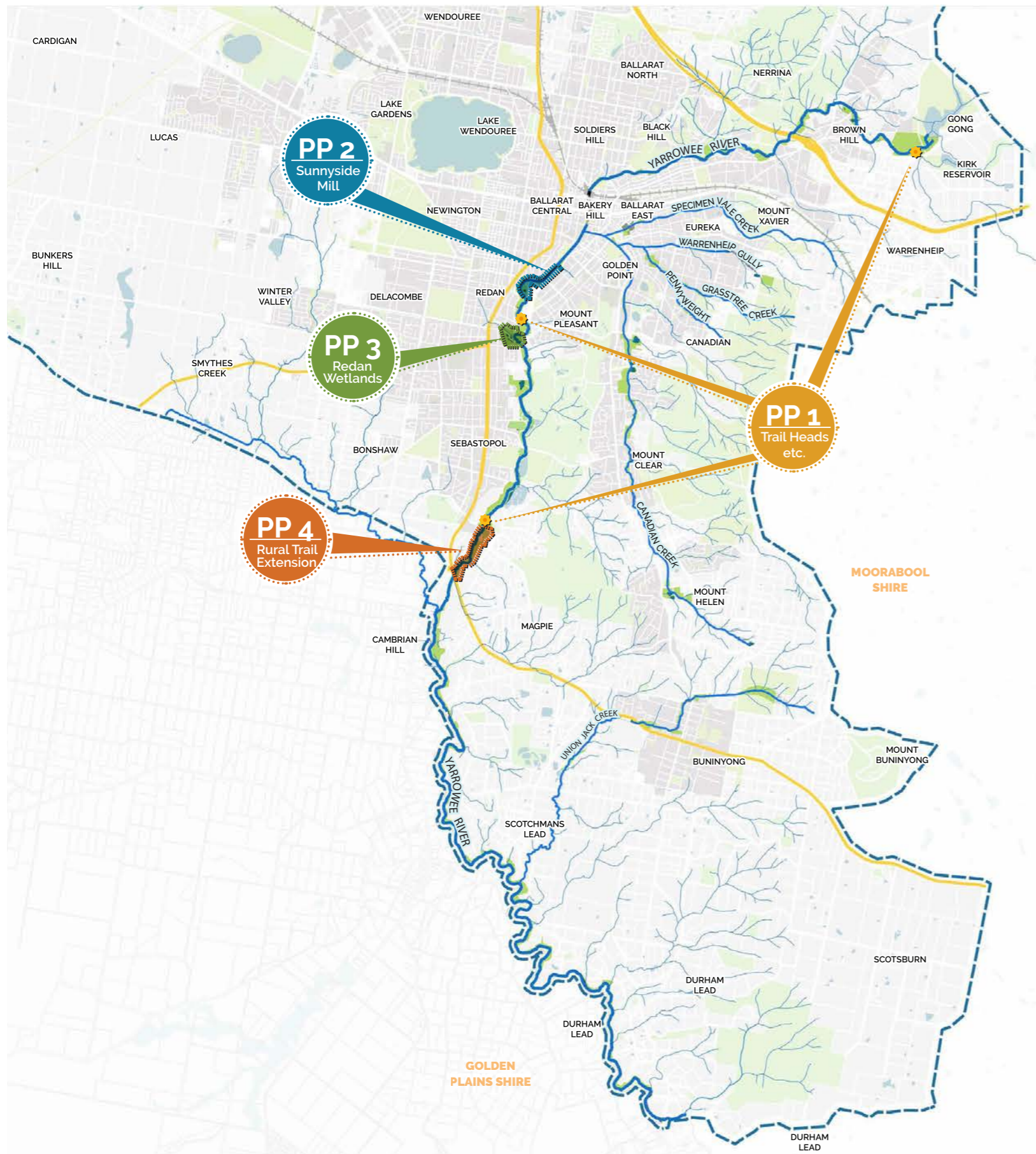
The Priority Projects were chosen for further development by City of Ballarat and the Project Working Group from a list of over 25 major projects determined from the Masterplans. These projects allow for small scale testing of ideas along the waterways to develop best practice model projects that may be applied elsewhere. Each of the Priority Projects includes a concept plan, a vision, detailed description and benefits, suggested staging and an itemised opinion of probable cost spreadsheet. These projects provide a 'ready-to-go' brief suitable for funding application or further detailed design for short term delivery. The four Priority Projects are:

- 1) Trailheads, signage and interpretation.
  - Southern trailhead at Dowcra Street
  - Prest Street lookout
- 2) Sunnyside Mill Parklands
- 3) Revitalisation of Redan Wetlands.
- 4) Rural Trail Extension - upgrade reserve from Dowcra Street to Midland Highway



# Priority Projects

## Overview



## Priority Projects

The Priority projects allow for small scale testing of ideas along the Yarrowee River and tributaries, which are to be completed within a short time frame. Projects have been selected to meet the following criteria:

- Total value up to \$1 million per project - some features may be staged
- Delivered within a time frame of 5 years (by 2025)
- Projects are unique to this masterplan and not covered in other COB reports and strategies
- Due to size and complexity of this study, projects are selected to cover diverse issues and geographic area
- Projects should demonstrate a significant improvement in environmental and / or recreational values
- Develop best practice model projects that may be applied elsewhere

### 1) Trail heads, signage and interpretation

- Southern trailhead at Dowcra Street including carparking, picnic area, wayfinding signage and launch point for the proposed Yarrowee Kayak Trail
- Prest Street lookout including opportunity to celebrate previous tree planting and environmental works undertaken along the Yarrowee River corridor

### 2) Sunnyside Mill Parklands

Including:

- Loop trails and fencing along channel
- Rest node with drinking fountain and bike repair station
- Carparking for Active Transport Link into Ballarat CBD
- Flexible open space on old transfer station site
- In-stream and riparian planting
- New bridge crossing
- Wetland revitalisation
- Opportunity to develop precinct in conjunction with ongoing improvements to the Sunnyside Mill building and the projected increase in public usage
- Litter trap - location subject to future feasibility study

### 3) Revitalisation of Redan Wetlands

Including:

- Loop trails
- Weed control, silt and litter management
- Boardwalks and picnic shelter
- Revegetation on embankments, increased canopy trees and wetland species diversity

### 4) Rural Trail Extension - Upgrade reserve from Dowcra Street to Midland Highway

Including:

- New trail extension
- Fencing
- Weed and erosion control
- Revegetation
- Redevelop billabong into wetland learning space
- Kayak trail

*Note: designs indicated are subject to further ground truthing / survey and constraints such as environmental or cultural heritage requirements.*

Refer to Masterplan, Priority Projects and Recommendations section of the report for further detail and costing for each Priority Project

# Project Action Plan

A detailed Action Plan accompanies this Report and has been provided in spreadsheet format below. Project actions have been divided into 8 categories:

- Access and Trails
- Rehabilitation, Revegetation and Vegetation Management
- Water Quality and Wetlands
- Sludge and Contaminated Sites
- Recreation and Parks
- Land Tenure and Future Land Development
- Community Engagement and Education
- Sustainable Management of Waterways

Priorities have been developed in collaboration with the City of Ballarat to aid in future resourcing and funding decisions.

Note: priorities may change due to future budgetary, cultural heritage and environmental considerations and funding availability.

## Supporting Documents

(abbreviations in **bold**):

Greater catchment reports:

- Corangamite Waterway Strategy 2014-2022 (Corangamite CMA) **CWS**
- Upper Barwon Yarrowee Leigh **FLWS** study update, 2019 (Corangamite CMA)
- Leigh Catchment Group Strategy 2017-2023 (Leigh Catchment Group) **LCG**
- Bunanyung Landscape Alliance Establishment Document Strategic Plan

City wide reports:

- Yarrowee River Corridor Landscape Masterplan & Land Management Plan, 1995
- Linear Network of Communal Spaces (LINCS) Strategy, 1996
- Yarrowee Sub-catchment Masterplans, 2003 **YSC**
- Ballarat Open Space Strategy, 2008 **BOS**
- Breathing Life into the Yarrowee River Project, 2013 **BLY**
- Urban Forest Action Plan March 2019 **UFP**
- Urban Forest Discussion Paper 2017 **UFP**
- Greening Ballarat - a Green-Blue Action Plan, 2016 **GBP**

- Ballarat Strategy 2040 **BS2040**
- Ballarat City Integrated Water Management Plan, 2018 **IWM**
- Stormwater Management Plan, 2010
- Stormwater Management Plan, 2002
- Ballarat Cycling Action Plan **CAP**

Regions of the City:

- Ballarat East Local Area Plan, 2019 **BEL**
- Bakery Hill Urban Renewal Plan, 2019 **BHUR**
- Brown Hill Local Area Plan & Infrastructure Assessment, 2019 **BHL**
- Little Creeks do Matter, the Eleven Creeks of Canadian (FOCC) **FOCC**
- Woookarung Regional Park Strategic Directions Plan (Parks Victoria) **WRP**
- Draft Parks Masterplan Summary (CHW) **DPM**

Ref. Map / Pg no.	Project Name	Location						Description	Priority	Supporting Document	Future Design Required
		Yarrowee River and Tributaries	Yarrowee River North	Yarrowee River Central	Yarrowee River South	Yarrowee River Rural	Tributaries				
<b>Access and Trails</b>											
Pg. 31	Loop trails - local						Develop local loop trails in high use / urban areas and around features of interest.			BEL, BHL, BLY, BOS, BS2040, YSC, CAP	Yes
Pg. 31	Loop trails - Ballarat region						Connect the Yarrowee River and tributaries to create opportunities for longer rides / walks between suburbs and smaller townships in the Ballarat region. Longer loop trails may be a day trip and should provide high quality visitor infrastructure and experiences. Opportunity for longer loop trails to be used as routes for running / cycle events.			BEL, BHL, BOS, CAP, YSC	Yes
	Connections to Woookarung Regional Park						Provide trails and directional signage to promote a connection from Canadian Creek, Warrenheip Gully and Specimen Vale Creek to Woookarung Regional Park trailheads.			BEL, BOS, WRP, YSC	Yes
	Improve pedestrian and cycle links						Improve pedestrian and cycle trail links and signage to nearby parks, roads and existing foot path network.			BEL, BHL, BOS, BS2040, CAP, YSC	
PP2, YN4, YC1, YC2, ET1. Pg. 31	Active Transport Link						Develop separated pedestrian and cycle trail and infrastructure that allows people to park outside the CBD and walk / ride along the Yarrowee River Trail into the CBD. The 'active transport link' may also be used to connect people to the train station, schools, shops and services. May include car park, upgrade of existing trails or provide new trails, bike repair station, drinking fountain, signage / branding, canopy tree planting and path edge planting.			BEL, BHL, BOS, BS2040, CAP, YSC	Yes
PP1	Signage strategy (Incorporated in Priority Project 1)						Develop a dedicated Yarrowee River and tributaries signage strategy including trailhead, wayfinding / directional, interpretation, safety / compliance signage.			BOS, BS2040, CAP	Yes
	Themed trails						Develop themed trails to share local stories relating to the river / creeks, indigenous heritage and indigenous vegetation. Provide interpretation of local cultural and heritage including stories / sites / features of importance to the local Wadawurrung people and gold mining era. Themed trails may include signage, markers, seating and planting.				Yes

Project Action Plan cont.

Ref. Map	Project Name	Yarrowee & Trib.	North	Central	South	Rural	Tributaries	Description	Short / Medium Term	Long Term	Ongoing	Supporting Document	Future Design Required
PP4	Kayak trail (Priority Project 4)							Provide kayak launch points in wider reaches of the Yarrowee River. One possible kayak trail starts from Docwra Street, Sebastopol and ends at Glassons Road, Cambrian Hill. A second possible kayak trail is between South Durham Bridge Road and Buninyong - Mt Mercer Road in Durham Lead. Launch points to include car parking, signage and selected visitor facilities. Paddling activities will be subject seasonal flows.					Yes
	Improve existing trail accessibility							Improve accessibility of existing trail system with additional sections of trail, pram crossings, refuge islands and signage to identify adjoining roads.				BEL, BHL, BOS, BS2040, CAP	
	Upgrade existing trail to Shared Path status							Upgrade existing trail in high use / urban areas to shared path status with a minimum width of 2.5m, subject to available space.					
	Trail surface							Surface of the trail will depend on location, level of use and maintenance levels. Hard surface (i.e. concrete / asphalt) will be appropriate in high use / urban areas / flood prone areas. A granitic sand surface is generally preferred for walking / running, and should be provided as an alternative option wherever possible. In areas where there is currently no access (i.e. south of Docwra Street on the Yarrowee River), it is recommended that a maintenance access track be constructed (may be a graded unsurfaced track) in the short to medium term, and then upgraded to a trail / shared path as use demands.					
	Boardwalk over channel							Opportunity to provide a cantilevered boardwalk over the channel in areas where pedestrian / cycle access is restricted, including along Steinfield Street, Anderson Street and Eastern Oval, to improve accessibility and amenity of trails around the CBD.					
	Bridges and crossing points							Additional bridges and crossing points to provide improved connectivity across the River and creeks. Bridges to be constructed to sufficient width to allow for maintenance access if required, with removable bollards for controlled vehicle access.				BEL, BHL, BOS, BS2040, CAP	
	Semi-transparent fencing							Recommend minimum 50% semi transparent fencing for all new fences along private land adjoining the river and creek corridors.					Yes
PP2 +	Channel safety barrier (Included in Priority Project 2)							Improve safety by planting a vegetation barrier and / or constructing a fence between the trail and channels in high use areas.					
	Opportunities to interact with water							At suitable selected sites, provide safe water interaction areas and crossings such as large stepping stones across the river / creeks (supplementary to bridges).					
	Intersection safety							Upgrade road intersections that cross the Yarrowee River and tributaries to ensure a high level of user safety including adequate lighting, signage, pram crossings and refuge islands.					
	Public facilities and infrastructure							Provide high quality facilities along the Yarrowee River and tributary trails, and maintain the facilities to a high standard.				BEL, BHL, BOS	
	Unauthorised access							Restrict illegal vehicle access along and across the river / creeks to minimise dumping of rubbish, vegetation damage, and creek bed / bank damage and erosion.				BLY, YSC	
<b>Rehabilitation, Revegetation and Vegetation Management</b>													
	Ongoing funding commitment							Provide ongoing funding for weed and pest control along river / creek corridors to ensure long term sustainability and encourage natural regeneration of indigenous species.				CWS, LCG	
	Priority weed removal							Priority woody weed removal includes: - Willow - Gorse - Boxthorn - Pines - Hawthorn - Blackberry - Hemlock - English and Cape Broom - Spiny Rush - Ash				BLY, CWS, LCG	

Project Action Plan cont.

Ref. Map	Project Name	Yarrowee & Trib.	North	Central	South	Rural	Tributaries	Description	Short / Medium Term	Long Term	Ongoing	Supporting Document	Future Design Required
	Weed control							Implement a weed control program utilising a variety of suitable control techniques including controlled burning, chemical and mechanical methods. Control techniques and timing need to be carefully considered to minimise unintended impacts i.e. erosion / waterway instability and loss of habitat. Weed control should be part of a staged program, so that weeds are only removed in areas that have short term funding for revegetation. Ensure sufficient funding is allocated for follow up weed control over at least 3 years.				CWS, LCG	
	Pest animal control (feral)							Pest animal control pre and post planting to support the ongoing success of revegetation and preserve native fauna. Reduced feral animal numbers will assist with natural revegetation. Target species include Rabbits / Hares.				LCG	
	Grazing control (policy and laws)							Implement best practice on leased grazing properties. As funds and management resources permit, rescind grazing rights on land adjacent to the river and creeks to ensure short, medium and long term public access to the corridor, and establishment and protection of revegetation works.				LCG	Yes
	Grazing control (fencing)							Install stock proof fencing on title boundaries in rural areas where works are being undertaken to prevent grazing. Re-align existing fencing to correct title boundaries as required.				CWS, LCG	
	Proactive erosion control							Develop and implement erosion control measures to mitigate potential erosion caused by increased flows due to urban development and storm events.				BLY, LCG, YSC	Yes
	Instream bed and bank naturalisation and hydraulic controls							Develop and implement instream bed and bank naturalisation to improve ecosystem diversity - where space and conditions permit. Stabilise banks, undertake weed and erosion control measures and aquatic revegetation (as outlined below). Develop / identify good case studies at various locations along the river / tributaries. Possible sites include the Yarrowee River Urban Parkland and south of White Flat Oval adjoining Humffray Street.				BHUR, FLOWS, IWM	
	Revegetation of river / creek corridors on private land							Encourage / support landowners to control weeds / pests and revegetate waterway corridors. Note only biodegradable weed or jute mat may be used below 1:100 year flood level, do not use timber mulch.				CWS, FLOWS, IWM, LCG, YSC	
	Natural regeneration management							Land management (including weed and pest control) to encourage revegetation of the river / creek corridor with indigenous flora by natural regeneration methods.				CWS, FLOWS, IWM, LCG, UFP, YSC	
	Revegetation terrestrial zone							Revegetation of terrestrial zones with indigenous flora using tubestock / hikocell / direct seeding as appropriate. Opportunity for engagement with and participation of local community and Wadawaurung people. Note only biodegradable weed or jute mat may be used below 1:100 year flood level, do not use timber mulch.				BEL, BHL, BLY, CWS, FLOWS, IWM, LCG, UFP, YSC	
	Revegetation of riparian zone							Revegetation of riparian zones with indigenous flora using tubestock / hikocell / direct seeding as appropriate. Opportunity for engagement with and participation of local community and Wadawaurung people. Note only biodegradable weed or jute mat may be used below 1:100 year flood level, do not use timber mulch.				BEL, BHL, BLY, CWS, FLOWS, IWM, LCG, UFP, YSC	
	Revegetation of aquatic zone							Revegetation of aquatic zones with indigenous plants using tubestock / hikocell as appropriate. Opportunity for engagement with and participation of local community and Wadawaurung people. Note only biodegradable weed or jute mat may be used below 1:100 year flood level, do not use timber mulch.				BEL, BHL, BLY, CWS, FLOWS, IWM, LCG, UFP, YSC	
	Remnant vegetation							Protect, retain and enhance existing remnant vegetation. Identify areas of remnant vegetation that will need to be avoided or managed in the process of future works. Manage surrounds of remnant vegetation to encourage natural regeneration.				BEL, BHL, BLY, CWS, FLOWS, IWM, LCG, YSC	
	Screening planting							Planting of trees and shrubs to screen unattractive views, improve amenity and biodiversity, and support the urban forest strategy.				CWS, FLOWS, IWM, LCG, UFP	
	Canopy tree planting							Planting of trees within the river / creek corridor including a selection of indigenous, native and exotic trees to improve amenity and support the urban forest strategy. Avoid planting trees that are likely to become weeds.				BEL, BHL, CWS, FLOWS, IWM, LCG, UFP	
	Understorey planting							Planting of indigenous understorey species within the riparian corridor where space and conditions permit.				BEL, BHL, BLY, CWS, FLOWS, IWM, LCG, YSC	
	Trail edge planting							Planting of trees, shrubs, grasses and groundcovers along trails to enhance sensory experience along trails. Low tufting plants may be used as a barrier between the trail and unfenced sections of channel, or along steep banks of the river / creeks.				YSC	



Project Action Plan cont.

Ref. Map	Project Name	Yarrowee & Trib.	North	Central	South	Rural	Tributaries	Description	Short / Medium Term	Long Term	Ongoing	Supporting Document	Future Design Required
	Productive food							Plant productive trees within managed areas to provide an urban food forest and enhance the landscape character of the corridor. Indigenous or native trees are preferred. Avoid planting trees that are likely to become weeds or attract pests (including Grey-headed Flying Fox).				UFP	
	Green Streets							Develop sustainable and green streets where the Yarrowee River is underground. Consider integrated stormwater management and urban tree planting /greening. Green streets may also be developed along key roads linking to nearby parks (i.e. Elsworth Street link to Woookarung Regional Park).				GBP, UFP, IWM	
	Ecological corridors							Develop and enhance ecological corridors to provide links to key habitat areas within the Ballarat region, including Woookarung Regional Park.				BS2040, FLOWS, GBP, IWM, LCG, WRP	
	Manage and maintain revegetation							Regular monitoring, maintenance and management for natural revegetation and follow up planting in revegetation areas to ensure long term viability and sustainability.				CWS, FLOWS, IWM, LCG	
	Mowing and maintenance							Reduce mowing area within river corridor to encourage regeneration of indigenous flora and reduce ongoing maintenance costs. Regular mowing should be undertaken in the following areas: - 3m minimum width either side of trail - picnic and seating areas - active recreation areas - selected sites that provide access to the river bank - periodic mowing of selected areas for fire hazard reduction Consider mulching and revegetating areas of previously slashed grass or weed infested areas.				YSC	
ET5	Sparrow Ground Reserve							Manage Sparrow Ground for its native flora, restricting mowing around waterway (not within recreation areas) to a minimum and reducing weed populations.					
YN2	Rickey's Quarry							The former Rickey's Quarry site is designated as a Flora Reserve but it would be better classified as a Bushland Reserve. With much weedy understorey, and a varied bird population, this seems a more appropriate classification.					
	Native fauna audit							Audit of native fauna present and establishment of bio-indicator species. Develop a management plan to allow for successful ecological works, revegetation and ongoing management of feral animals. Fox management in particular is a key to protecting native fauna within this landscape. The audit will provide an important benchmark to review against in future years. This could be delivered with through the community as a citizen science activity e.g. bioblitz.				FLOWS, LCG	Yes
<b>Water Quality and Wetlands</b>													
	Gross Pollutant Trap (GPT) / litter trap							Installation of GPT's and litter traps at key locations to improve litter and large rubbish.				BLY, IWM	Yes
	WSUD sedimentation basins and swales with litter trap at stormwater outlets							Where space permits, install WSUD sedimentation basins and litter traps at stormwater points prior to entering the river and creek system to remove litter, pollutants, sediments and heavy metals.				BLY, IWM, YSC	Yes
	Litter traps							Install litter traps on each tributary of the Yarrowee River and on offline wetlands.				BLY, IWM, YSC	
	Urban rain gardens & tree pits							Develop urban rain gardens and tree pits where space and conditions permit to improve water quality, habitat and amenity in accordance with the urban forest strategy.				CWS, IWM, LCG, YSC	Yes
	Ballarat South Wastewater Treatment Plant discharge							Maintain discharge into the Yarrowee River from Ballarat South Wastewater Treatment Plant as a beneficial environmental flow. Opportunity to better replicate natural flow regimes. Consider a winter storage lagoon and improved mixing of discharge water.				CWS	
YS2	Yuille Wetland							Protect and enhance existing wetland vegetation. Investigate the potential for water from the river to be diverted through to Yuille Wetland. Extend trails to provide a loop trail around the wetland. Opportunity to develop a new wetland, to be filled using water from Ballarat Gold Mine and CHW winter storage - subject to negotiations with Ballarat Gold Mine and Central Highlands Water.*				CWS, FLOWS, IWM, LCG	
PP3	Redan Wetland revitalisation (Priority Project 3)							Water from the Redan wetlands is diverted to refill Lake Wendouree. Review and redesign wetlands and integrated sedimentation pond, litter traps and GPT to improve effectiveness. Improve vegetation including establishing clumps of trees around the wetland for shade and biodiversity. Provide additional loop trails				BLY, CWS, FLOWS, IWM, LCG	

Project Action Plan cont.

Ref. Map	Project Name	Yarrowee & Trib.	North	Central	South	Rural	Tributaries	Description	Short / Medium Term	Long Term	Ongoing	Supporting Document	Future Design Required
PP2	Sunnyside Mill wetland upgrade (Priority Project 2)							Upgrade existing wetland. Provide loop path and bridge to improve connection to existing Yarrowee River Trail. Improve aquatic / riparian planting. Redevelop decommissioned transfer station raised area as a flexible open space for various events				CWS, FLOWS, IWM, LCG	Yes
YS3	Docwra Street wetland - design and construction							Develop new wetlands within existing floodplain / swampy riparian area to improve water quality and habitat diversity values, in an otherwise degraded and barren area.				CWS, FLOWS, IWM, LCG	Yes
YR1	Winter Creek wetland - planning							The rapid urban development of Ballarat West will impact the water quantity and quality in Winter Creek. Develop a series of wetlands along Winter Creek (subject to flood studies) and new wetland at the confluence of Winter Creek and Yarrowee River to improve stormwater quality before entering the Yarrowee River.				CWS, FLOWS, IWM, LCG	Yes
	Woowookarung wetlands							Develop new wetlands within the Woowookarung Regional Park on existing drainage lines to improve water quality and habitat diversity values. Wetlands may be designed as a chain of ponds with a wetland / environmental education trail. Locate wetlands to minimise disturbance of existing indigenous vegetation. Provision of permanent pools of water will be environmentally beneficial for the Woowookarung Regional Park.				WRP, CWS, FLOWS, IWM, LCG, YSC	Yes
	Billabongs							Retain, protect and enhance existing billabongs including fencing, weed and pest control and revegetation with indigenous species. Provide minor civil works to ensure regular filling / flushing of billabongs.				CWS, FLOWS, IWM, LCG, YSC	Yes
	Waterway habitat diversity							Retain, protect and enhance diverse habitat types within the river / creek catchments for native fish including riverine pools, riffles, runs, woody debris, undercut banks, rocks and boulders, swamps and floodplains wetlands. Ensure these habitats are created and maintained by adequate flow regimes.				FLOWS	
<b>Sludge and Contaminated Sites</b>													
	Sludge mapping							The Yarrowee River is a case study for the 'Rivers of Gold' project. Request access to sludge mapping prepared by the research team. The sludge mapping will help in understanding the impacts of gold mining along the Yarrowee.				www.rivers-of-gold.com	
	Sludge and contaminated sites management plan							Develop a sludge and contamination management plan with a qualified soil hydrology scientist that includes evaluation and recommendations for rehabilitation of contaminated land, with the aim being to minimise impacts of sludge and contamination movement down the catchment.					Yes
	Investigate mining company gold recovery and rehabilitation options							Options to be discussed with stakeholders					
	Capping of contaminated sites (including former gun club)							Options to be discussed with stakeholders					
	Planning scheme action							Investigate the need to apply an Environmental Audit Overlay to contaminated sites.					
<b>Recreation and Parks</b>													
YC1	Yarrowee River Urban Park							Opportunity to reconnect the CBD with the Yarrowee River by redeveloping the existing car park between Little Bridge Street and Eastwood Street into an urban park and expose sections of Yarrowee River. Need to reference the Bridge Mall Rejuvenation Project, part of the Bakery Hill Renewal Plan, which will be the key driver for outcomes in this precinct.				BHUR, IWM	Yes
YN5, ET1	Pocket Parks							Develop pocket parks to provide opportunities for recreation and socialising in a green space. Consider integrating WSUD features for additional environmental benefits. Pocket parks may be located in areas of under-used open space that are safe and accessible, and in close proximity to existing services and amenities. Consider impacts on existing vegetation, wildlife and surrounding residents. Possible sites for pocket parks include: - Morres Street between Newman Street and Queen Street North, Ballarat East - Confluence of Warrenheip Gully and Canadian Creek, Golden Point				YSC	Yes
YN2, YR2, YR5, YR8	Picnic facilities							Develop new picnic facilities at key sites including: - Brown Hill (near Ballarat Primavera Bed and Breakfast) - Glassons Road, Cambrian Hill - Scotchmans Lead Road, Scotchmans Lead - South Durham Bridge Road, Durham Lead Consider safety, accessibility, adjoining resident amenity and impact on existing environmental values.				BOS	

Project Action Plan cont.

Ref. Map	Project Name	Yarrowee & Trib.	North	Central	South	Rural	Tributaries	Description	Short / Medium Term	Long Term	Ongoing	Supporting Document	Future Design Required
PP1, YN1, YN4, YC1, YS3 & YR9 Pg. 31	Major Trailhead (Priority Project 1)							Upgrade facilities at major trailheads. Facilities may include car park, shelter, signage, toilets, picnic facilities, drinking fountain, nature play space and planting. Major trailheads are proposed at the following locations: - Gong Gong Reservoir Park - Nerrina Wetlands - Little Bridge Street / Eastwood Street, Ballarat CBD - Docwra Street, Sebastopol - Buninyong - Mt Mercer Road, Durham Lead				DPM	Yes
	Increase active recreation opportunities							Increase opportunity for safe active recreation for all ages i.e. fitness circuit, children's playspace, mountain bike trails etc.				BOS, CAP	Yes
	Covering of channel							Consider part covering of channelised sections of the Yarrowee River and tributaries where there are demonstrated improvements to amenity, access and recreational values, subject to heritage assessment. Covering of channel may be an option for Eastern Oval to improve the recreational potential and access through this precinct.					Yes
YN1, YC1, CC1, YR9	Masterplan / landscape plan recommended for existing / future parks							Prepare a masterplan / landscape plan for existing or future parks to enhance connection to river / creeks and improve environmental and recreational values. A masterplan or landscape plan is recommended for the following sites: - Gong Gong Reservoir Park (in collaboration with CHW) - Canadian Creek Reserve in the vicinity of Canadian Lakes Estate - Buninyong - Mt Mercer Road trail head / picnic area - Future sites that become Council owned / managed land adjoining the river / creek corridor				BEL, BHL, BOS, YSC	Yes
<b>Land Tenure and Future Land Development</b>													
	Planning policy study							Recommend council Strategic Planners review the Action Plan to ensure relevant recommendation are developed and incorporated into the Planning Scheme. Review and develop planning controls for land adjoining the Yarrowee River and tributaries corridor. Ensure planning policy supports key recommendations of this masterplan, including flood prone land, access and trails, preserving remnant vegetation, and improving ecological and environmental values of the river / creek corridor. Encourage new development to provide an active frontage to the river / creek corridor.					
PP4	Fence reserves adjoining private farm land (part of Priority Project 4)							Install stock proof farm fencing on all reserve title boundaries adjoining private farm land to minimise damage to river corridor / bed / banks by stock and allow for future revegetation works.				CWS	
	Potential undeveloped land acquisitions							Consider the strategic acquisition / land swap of land that is inappropriate for residential development due to floodplain, steep escarpment, condition and / or potential connections. This land will have significant value for public use / conservation purposes.					Yes
	Continuous river corridor							Develop planning controls that require all new development to be generally setback minimum 15m from top of river / creek bank to create a continuous open space corridor. Encourage reserves wider than 15m where there is significant recreational opportunities, habitat value or existing remnant vegetation. Provide strong links to the river / creek corridor from nearby parks and surrounding roads.				BEL, BHL, BOS, BS2040	Yes
	Development on flood prone land							Ensure development on flood prone land responds to applicable flood controls in the 'land subject to inundation' and Flood Overlays. Aim to protect, enhance and regenerate wetlands, floodplains and river / creek corridors. As part of development applications require detailed landscape plans to be prepared for flood prone land that complies with the Yarrowee masterplan documents.					Yes
	Link open space to river corridor							Ensure planning applications provide clear path linkages from new residential development and open space to river corridor.					Yes
	Ecological assessment							Develop planning controls that require developers to provide assessment of river and creek corridor health and potential for restoration to reasonable health. Assessment may include water quality, fish, frogs, macro invertebrates, aquatic and riparian vegetation. Proposed development works should aim for a net biodiversity improvement. Opportunity for developers to make contributions towards improving waterway health within their catchment.				FLAWS, LCG, WRP	
	Industrial developments							Develop planning controls that require new industrial developments to include on site stormwater management / treatment and WSUD to trap litter, sediments and heavy metals prior to stormwater release to the Yarrowee River and tributaries.				EPA	Yes

Project Action Plan cont.

Ref. Map	Project Name	Yarrowee & Trib.	North	Central	South	Rural	Tributaries	Description	Short / Medium Term	Long Term	Ongoing	Supporting Document	Future Design Required
<b>Community Engagement and Education</b>													
	Community ownership, engagement and participation							Encourage / support community ownership, engagement and participation on both public and private land along the river / creek corridor including involvement with friends and Landcare groups.				CWS, LCG	
	Indigenous knowledge and living culture							New projects to seek involvement and support of the Wadawurrung people. Project proponents should approach their contribution with flexibility to allow for a broad range of cultural knowledge and values to enrich projects. Explore opportunities for indigenous plantings to provide a valuable resource to enhance and promote living culture i.e. medicinal plants, food plants and resources for traditional crafts. Consider the inclusion of spaces for gathering and practicing living culture. The location and facilities will be specific to the communities needs and should be directed by the Wadawurrung community. Discuss commercial / tourism opportunities with the Wadawurrung community. Explore ways to support these opportunities. Promote the Yarrowee River and tributaries as an inclusive space and share the indigenous historical and cultural importance of the waterways. Precedent projects include: - Deniliquin Lakes, NSW which incorporates reed beds with weaving circles and a native fish breeding program - Three Rivers Festival at Moama Botanic Gardens NSW - Yalingbila Bibula Mooloomba Minjerribah (Whale on the Hill Point Lookout, North Stradbroke Island)				CWS, LCG	
	Yarrowee River brand and awareness							Create a singular name for the Yarrowee River trail. Develop a strong brand identity which captures the Yarrowee River as a destination, as an important part of Ballarat's lifestyle and as a natural system connected to the wider region (i.e. upper catchment of the Barwon River).					
	Continue to educate adjacent land owners							Continue to educate and support adjacent landowners about weeds, water quality, litter, and revegetation. Aim to get their understanding and support for the future direction of the Yarrowee River and tributaries masterplan.				LCG	
	History education							Develop an engaging and relevant interpretation strategy to promote the history of the Yarrowee River and tributaries including cultural heritage, the gold mining era, the industrial progress of Ballarat and rehabilitation of waterways.					
	Environmental education							Develop education opportunities with local schools to promote awareness and understanding of the natural waterway system. Seek partnerships with educational institutions at all levels.				LCG	
	Waterwatch citizen science projects							Provide opportunities for ongoing community involvement in Waterwatch monitoring and research along waterways. Examples of possible programs include a frog / platypus / water bug census, water quality and salinity testing and litter clean up days.				CWS	
	Digital media promotion							Upload high quality digital content including photos / video / drone footage to promote the Yarrowee River and tributaries attractions and experiences. Encourage local artists and general public to submit content. eg. Visualising Ballarat					
Pg. 31	Walk / cycle map							Develop a trail map / brochure for the Yarrowee River and tributaries and loop trails, to be made available at the Visitor Information Centre and digital version online.				YSC	

Project Action Plan cont.

Ref. Map	Project Name	Yarrowee & Trib.	North	Central	South	Rural	Tributaries	Description	Short / Medium Term	Long Term	Ongoing	Supporting Document	Future Design Required
<b>Sustainable Management of Waterways</b>													
	Ballarat Waterways / Wetland / Native Vegetation Management Team							Ensure relevant skills, experience, funding and resources are available for waterway management within the CoB staff to manage and improve waterway function, habitat value, biodiversity, amenity and aesthetics along the Yarrowee River and tributaries and throughout the City. The team should include a community engagement officer to encourage community engagement and participation in waterway planning, design, planting and maintenance. The team should be trained in native plant identification and careful use of herbicides.				CWS, LCG	
	Land management groups							Encourage and support land management groups including Friends Groups and Landcare Groups to continue their planting and maintenance works along river / creek corridor. Many volunteers are willing to work in their local areas if properly organised and supported.				CWS	
	Areas of Aboriginal cultural heritage sensitivity							Areas of cultural heritage sensitivity include all named waterways (200m buffer either side). Identify areas or sites of sensitivity that will need to be avoided or managed in the process of future works. Undertake an on-ground high level assessment with the Wathaurung Aboriginal Corporation and Council representatives to identify known and potential locations of significance. Ensure this assessment is completed well before works commence to avoid delaying the project.				FLAWS, LCG	Yes
	Winter Creek masterplan							The rapid urban development of Ballarat West will impact water quantity and quality in Winter Creek. Develop a masterplan including assessment and recommendations for the Winter Creek corridor and catchment.				CWS, FLOWS	Yes
	Naming of creeks							Naming of unnamed creeks to raise awareness of their existence and importance. Consider using local Wadawurrung language names. Consider renaming 'Lal Lal Drain' to 'Lal Lal Creek' to remove negative connotation associated with a drain.				FOCC	
	Catchment management principles							Develop and implement catchment management principles that aim to balance use and conservation of natural resources on a whole of catchment basis.				CWS, FLOWS	Yes
	Collaboration							The Yarrowee River and tributaries cover a large area with complex issues, therefore many projects will require the combined efforts and collaboration of Council departments, partner organisations, stakeholders and community working together to achieve sustainable outcomes. The rural reach of the Yarrowee River is on the boundary of City of Ballarat and Golden Plains Shire and will require cross border negotiation and planning to successfully implement projects.					
	Emergency services / access							Develop a Yarrowee River and tributaries emergency management strategy including emergency markers / signage and access points for emergency vehicles. Planning and design of works along the river / creeks should consider ways to prevent and minimise the risk of fire and flood damage to infrastructure. New works must comply with relevant planning controls such as flood overlays and Bush Fire Management Overlay.				BLY, YSC	

## Project Background

Learning from the past, preparing for the future



*Aerial view of the Yarrowee River and trail at Ditchfield Bushland Reserve*

# Project Background

Learning from the past, preparing for the future

## Preparing for change

The City of Ballarat is preparing for change. Ballarat's population is expected to grow to 160,000 people by 2040<sup>1</sup>. This growth is expected to be focused to the north and west of the city.

As a result, the Yarrowee River will receive a projected 60% increase of stormwater flows<sup>2</sup>. The majority of this flow is expected to flow from Winter Creek (outside of the project scope), which will have a significant increased urban development in its catchment. The population growth will also place a premium on public open space and will result in more people using the Yarrowee River and tributaries for access and recreation.

Ballarat has already felt the impact of climate change and population growth. The City continues to strive to be a leader in water management and create 'a greener, more vibrant and connected Ballarat'. This masterplan will play a key role in bringing this vision to life.

## Previous report and purpose of the Masterplan review

In 1995, Thomson Hay Landscape Architects and Roger Thomas in association with the Linear Network of Communal Spaces (LINCS) Committee prepared the Yarrowee River Corridor Environmental and Recreational Assessment Report, Landscape Masterplan and Land Management Plan. This Masterplan and subsequent projects have transformed significant parts of the river, including improved habitat and biodiversity, new walking/riding trails and improved pedestrian/cycling connections, increased community use and appreciation of the river as a public space. David Hay and Roger Thomas were directly involved in the development of these plans at the time.

This Masterplan Review aims to build on the success of earlier projects and continue the process of transforming the Yarrowee River over the next 25 years into a valuable linear outdoor space for the Ballarat region. The ongoing process of developing the river as a place for significant recreational, environmental and educational values will, in turn, provide economic, social, environmental and physical health benefits for the community. This report aims to guide the development and maintenance of the Yarrowee and its tributaries for the next 25 years.

<sup>1</sup> Refer to population growth projections in Ballarat Strategy 2040, page 254.  
<sup>2</sup> Refer to City of Ballarat Stormwater Management Plan, 2nd Edition June 2010.



Yarrowee dredging - 1899

## Site history

The Yarrowee River and tributaries is an important asset for the Ballarat region. The river has rich cultural, historical and environmental values. The Boro Gundidj, a clan of the Wadawurrung people, lived along the northern stretches of the Yarrowee River.

The Yarrowee River and tributaries are highly modified and regulated waterways. They have been historically affected by the gold rush and the urban development of Ballarat. The waterways were used for gold mining operations and were severely degraded by dredging and hydraulic processes causing major silting / sludge and stream bed changes along the river course. During the 1860s, much of the Yarrowee River and tributaries around the Ballarat CBD were contained in bluestone, brick and concrete channels to prevent erosion and help mitigate flooding. As industries developed the waterways became further degraded and polluted. The river through the CBD was re-routed, concreted and built over in the 1960's. It is now an underground channel between Eastern Oval and Eastwood Street.

More recently, the river has become a key focus for recreation and riparian habitat and linear reserve corridors, the 1995 Landscape Master Plan & Management Plan was developed for the Yarrowee River Corridor. Through the 1990's and until the present day these plans have formed the strategic basis for the restoration of these waterways. As a result, extensive works have been undertaken to improve habitat and biodiversity, create walking trails and improve public access and connections to further develop community use and appreciation of the waterways as public spaces.

## Site context

The Yarrowee River catchment covers most of Ballarat's urban / suburban area, and a significant rural area to the south. The Yarrowee River and tributaries are the headwaters to the Leigh River which ultimately drains to the Barwon River and into Bass Strait. These rivers are under the jurisdiction of the Corangamite CMA. As the Yarrowee-Leigh River is a major tributary to the Barwon River, works in Ballarat will have significant impacts downstream (both positive and negative).

Some of the stream flow in the upper tributaries of the Yarrowee River is diverted for water supply. Significant volumes of water flow into the Yarrowee River from the Ballarat South wastewater treatment plant and to a lesser extent, the Ballarat gold mine.

For the purposes of this report, the Yarrowee River and tributaries are divided into five reaches, based on the landscape character and conditions:

### Yarrowee River

- North (from Gong Gong Reservoir to Nicholson Street, Black Hill / Ballarat East)
- Central – channelised section (from Nicholson Street, Black Hill / Ballarat East to south of Hill Street, Redan / Mt Pleasant)
- South (end of channelised section to Docwra Street, Sebastopol)
- Rural (Docwra Street to bridge crossing on Buninyong – Mt Mercer Road)

### Tributaries

- Eastern tributaries including Canadian Creek (part), Specimen Vale Creek, Warrenheip Gully, Pennyweight Gully and Grasstree Creek
- Canadian Creek
- Union Jack Creek (previously called Buninyong Creek)
- Winter Creek – up to 500m upstream of confluence with Yarrowee River

## Policy, strategy and other projects within project study areas

Many relevant background documents and reports have been reviewed in relation to this masterplan including the following (all reports prepared by Council unless otherwise noted. Abbreviations in **bold**):

### Greater catchment reports

- Corangamite Waterway Strategy 2014-2022 (Corangamite CMA) **CWS**
- Upper Barwon Yarrowee Leigh **FLWS** study update, 2019 (Corangamite CMA)
- Leigh Catchment Group Strategy 2017-2023 (Leigh Catchment Group) **LCG**
- Bunanyung Landscape Alliance Establishment Document Strategic Plan

### City wide reports:

- Yarrowee River Corridor Landscape Masterplan & Land Management Plan, 1995
- Linear Network of Communal Spaces (LINCS) Strategy, 1996
- Yarrowee Sub-catchment Masterplans, 2003 **YSC**
- Ballarat Open Space Strategy, 2008 **BOS**
- Breathing Life into the Yarrowee River Project, 2013 **BLY**
- Urban Forest Action Plan March 2019 **UFP**
- Urban Forest Discussion Paper 2017 **UFP**
- Greening Ballarat - a Green-Blue Action Plan, 2016 **GBP**
- Ballarat Strategy 2040 **BS2040**
- Ballarat City Integrated Water Management Plan, 2018 **IWM**
- Stormwater Management Plan, 2010
- Stormwater Management Plan, 2002
- Ballarat Cycling Action Plan **CAP**

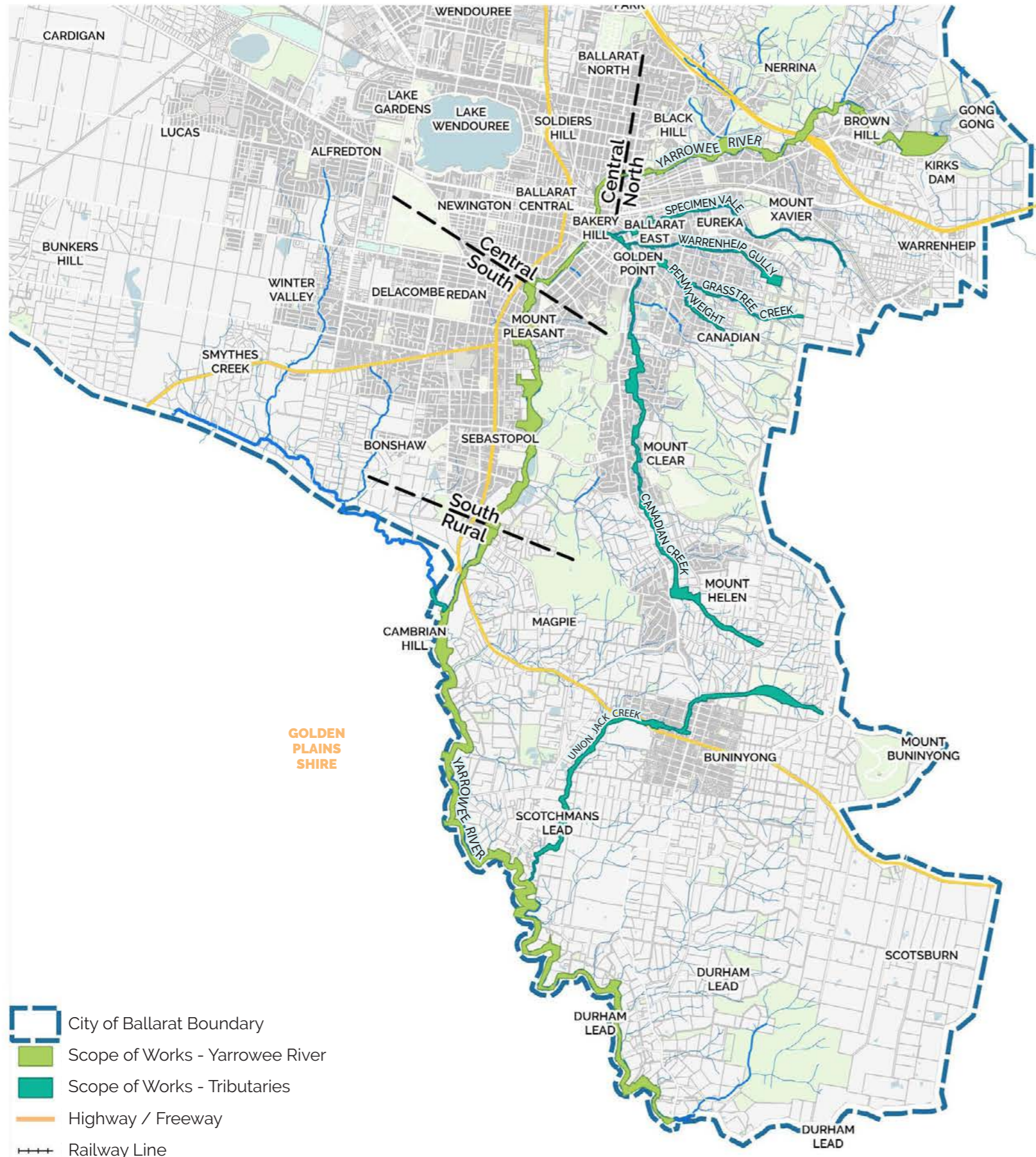
### Regions of the City

- Ballarat East Local Area Plan, 2019 **BEL**
- Bakery Hill Urban Renewal Plan, 2019 **BHUR**
- Brown Hill Local Area Plan & Infrastructure Assessment, 2019 **BHL**
- 'Little Creeks do Matter, the Eleven Creeks of Canadian' (FOCC) **FOCC**
- Woowookarung Regional Park Strategic Directions Plan (Parks Victoria) **WRP**
- Draft Parks Masterplan Summary (CHW) **DPM**



Sunnyside Mill historical photo

# Project Scope



## Project scope

The objectives of the Yarrowee River and Tributaries - River Corridor Masterplan Review are to:

1. Assess the broader recommendations of the earlier Plans
  - Review what has generally worked,
  - What hasn't worked,
  - What remains to be done,
  - What is no longer relevant or a priority
  - What are the major issues and priorities for future development, management and maintenance
2. Identify areas of previous rehabilitation works and make assessment as to the success or otherwise of these works. Recommend additional works if required for improvement.
3. Identify all existing walking paths, bridges and connections and make recommendations to improve public access, linkages, bridges and looping path opportunities
4. Identify sites of limited access through private property and make recommendations on methods and priorities for improving access and linkages.
5. Identify areas of degradation including weed infestation, physical damage, rubbish dumping or other.
6. Assess rehabilitated sites for opportunities to improve habitat. Advise on a suitable strategy to improve ground level light penetration and understory establishment
7. The review will consist of a series of plans including any detailed enlargements where required and a report that summarizes the findings and recommendations.
8. Generate a recommended program of works including priorities and staging and indications of likely costs for works.

This project focuses on the following elements:

- Water quality, litter and pollution reduction
- Revegetation, environmental and habitat values,
- Access and recreation

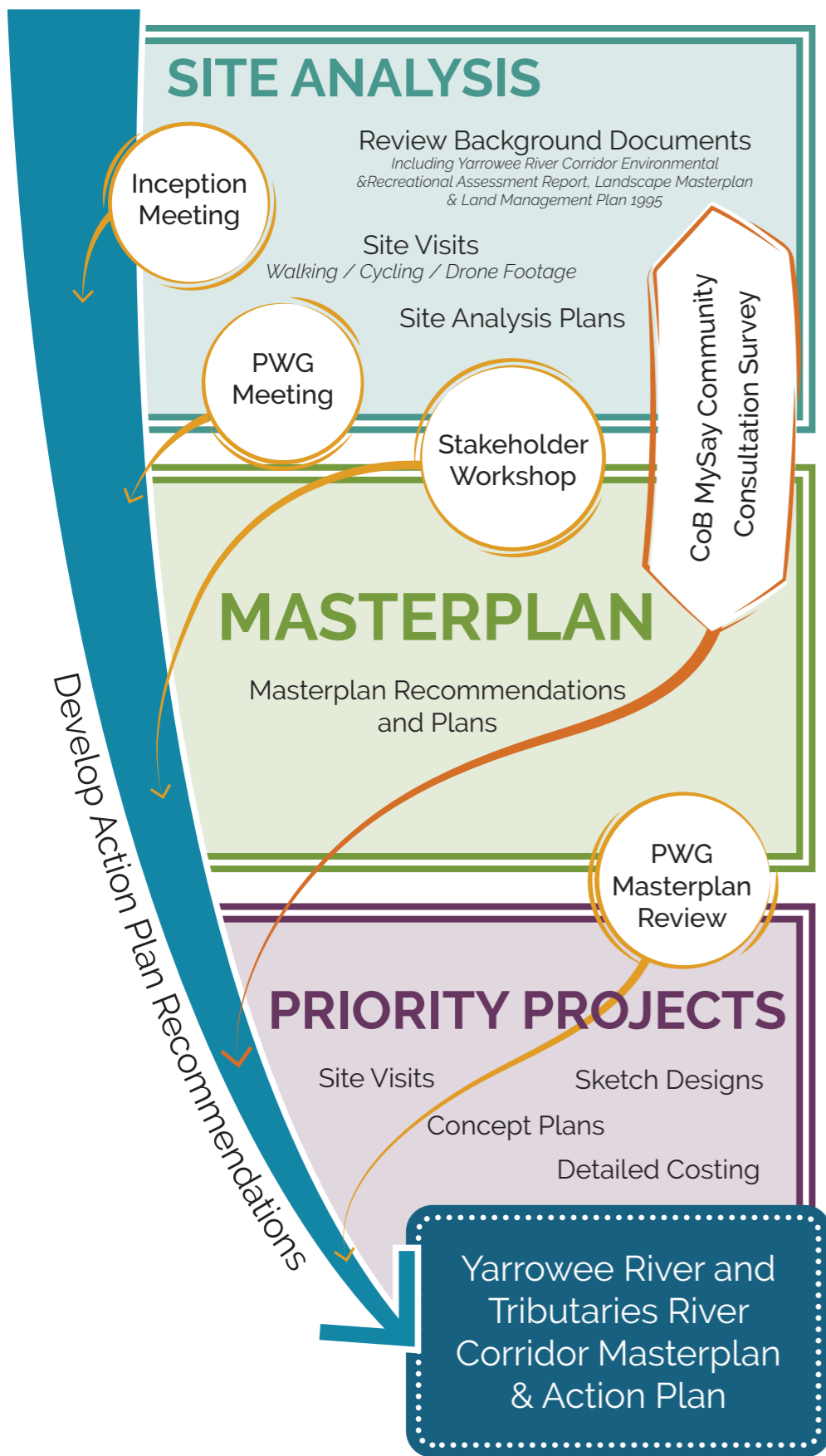
In addition, the following themes are covered

- Land Tenure
- Future development

Due to the length of the river and tributaries many existing plans, reports and projects address complimentary issues such as stormwater and flooding, blue green infrastructure and urban development. These issues are not required to be covered in detail by this report.



# Project Process and Community and Stakeholder Engagement



## Site Analysis

The project team assessed over 50km length of waterways along the Yarrowee River and tributaries. All accessible sections of the river / creeks were assessed on the ground by walking and riding. Inaccessible areas (on private land) were assessed using drone footage, aerial photography, maps and GIS data. Thomson Hay Landscape Architects have an original copy of historical aerial photos flown in 1994 of the Yarrowee River corridor which has provided a useful comparison.

Site analysis information includes

- River corridor and key tributaries
- River condition (channel/natural)
- Riparian condition (extent of vegetation, riparian width, canopy cover etc)
- Quality of habitat areas (within the corridor and any adjacent)
- Topography / landform
- Other features (i.e. existing WSUD assets, litter traps etc)
- Any sites or features of cultural/heritage interest
- Walking/cycling paths, public access points and linkages
- Adjoining land uses (i.e. residential, rural, industrial, natural, public open space)

The site analysis is documented as a series of maps at 1:5,000 scale.

## Masterplan

The masterplan has been developed with reference to the 1995 Yarrowee River Masterplan, relevant background documents and in consultation with partner organisations, stakeholders and the local community.

The masterplan is documented as a series of maps at 1:5,000 scale, combined with the project action plan. Key recommendations of the masterplan include:

- Provision of trails and access
- Rehabilitation, revegetation, vegetation management, weed and pest control
- Water quality improvement and wetlands
- Management of sludge and contaminated sites
- Development of parks and recreation facilities
- Land tenure and future land development
- Community engagement and education
- Sustainable management of waterways

## Priority Projects

Following Council review of the site analysis and masterplan, four key projects were selected including:

- 1) Trailheads, signage and interpretation.
  - Northern trailhead at Gong Gong (CHW project)
  - Southern trailhead at Dowcra Street
  - Prest Street lookout
- 2) Sunnyside Mill Parklands
- 3) Revitalisation of Redan Wetlands.
- 4) Rural Trail Extension - upgrade reserve from Dowcra Street to Midland Highway

## Community and Stakeholder Engagement

A variety of techniques were used to discuss the project with the community and stakeholders.

An online survey was conducted on the City of Ballarat MySay webpage to gain insight into community values and vision for the Yarrowee River and tributaries.

In the analysis phase of the project, stakeholders were invited to attend workshops to share their understanding of key issues and opportunities along the waterways. They were then given the opportunity to review and provide comment on the masterplan and action plan recommendations.

The project documents have been amended after each round of feedback to ensure the plans reflect the community and stakeholder vision for the future of their waterways.



Project stakeholder consultation maps & presentation - 26.11.19

## Some insights into the community feedback from the MySay survey

Top 5 statements agreed with

1. The river corridor supports a healthy lifestyle
2. It is easy to get to the river
3. I feel safe when I visit the river
4. The river is a social place
5. The river is well used by the community

Bottom 5 statements - little to no agreement

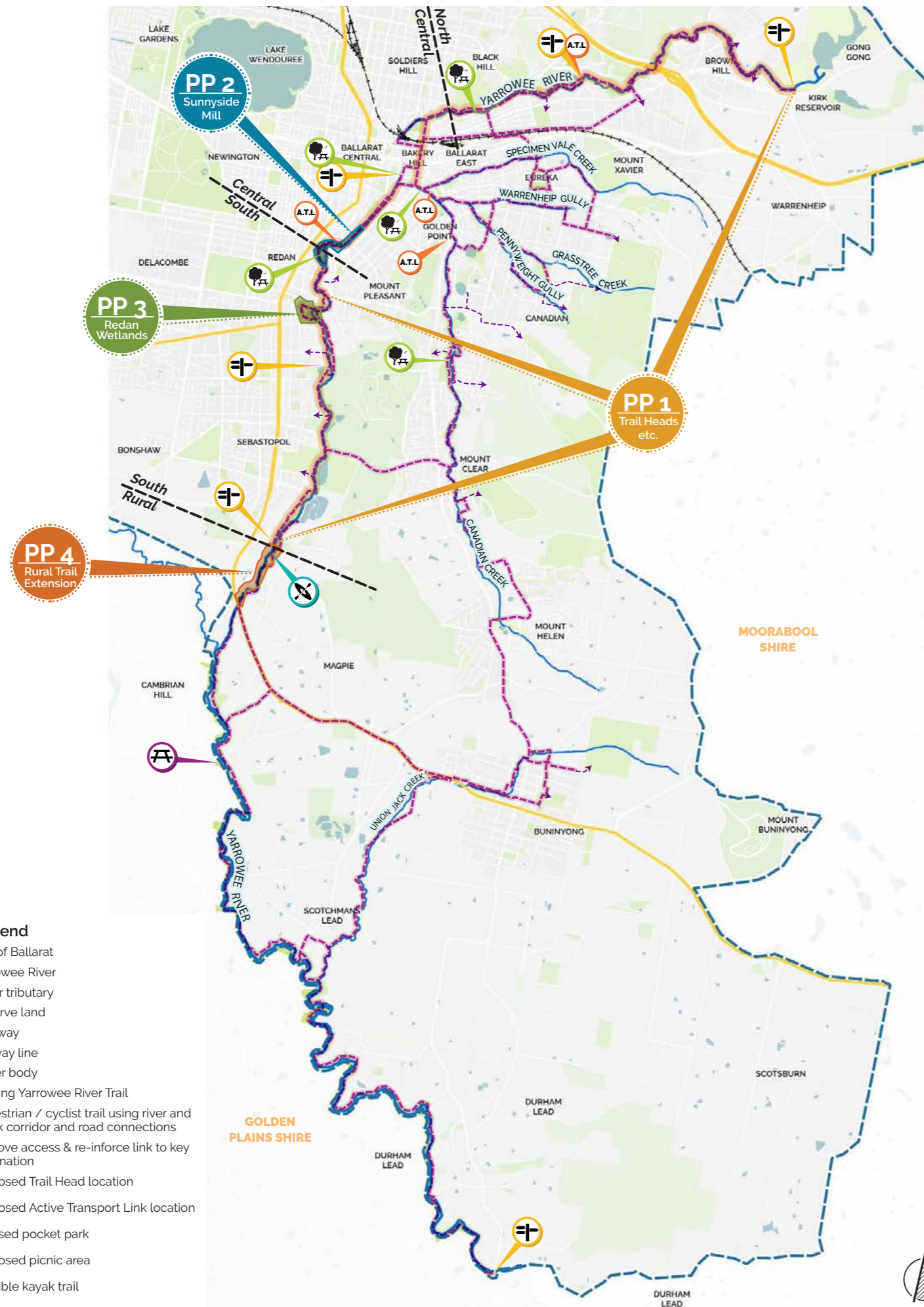
1. The history and stories of the Yarrowee River are well known and understood
2. There are sufficient resources allocated for the management of the river corridor
3. The ecology of the river system is high quality
4. There are sufficient public facilities along the river
5. The river corridor is well managed

Top 5 most important things within the Yarrowee River and Tributaries corridors

1. Good habitat and healthy plant life
2. Presence of native animal and birds
3. Clean water in the Yarrowee
4. Opportunities to assist in caring for the river and tributaries
5. Wayfinding and signage relating to history and stories of the river

Refer appendix for full survey result data and community feedback





## Priority Projects

- 1) Trailheads, signage and interpretation
  - Southern trailhead at Dowcra Street
  - Prest Street lookout
- 2) Sunnyside Mill Parklands
- 3) Revitalisation of Redan Wetlands
- 4) Rural Trail Extension - Upgrade reserve from Dowcra Street to Midland Highway

A vision statement, project description, concept plans and cost estimates for each Priority Project create 'mini business cases' to provide a 'ready-to-go' brief suitable for funding applications or development of detailed plans and documentation as required for subsequent delivery. See following pages for detailed Priority Projects

## Additional Future Major Projects

Possible additional projects that have been identified in the Yarrowee River and Tributaries Masterplan are listed below. These projects require further design development, costing and council and community consultation.

### General

- Encourage community ownership, engagement and participation along the river / creek corridor including involvement with Landcare and Friends Groups
- River / creek wayfinding signage strategy – including links to / from adjoining roads (separate project by COB?)

### North

- Loop trail at Brown Hill from Ainley Street to Nicholson Street / Eastern Oval
- Active Transport Link / trailhead from Nerrina wetlands to Ballarat Train Station / CBD
- Pocket park between Queen Street and Newmann Street.

### Central

- Establish a 'Green Street' along Peel Street, Little Bridge Street and Eastwood Street (separate project by COB?)
- Improve pedestrian and cycle trails around CBD i.e. cantilevered boardwalk over the Yarrowee / Canadian Creek channel (i.e. Steinfield Street, Anderson Street & Eastern Oval); option to make Anderson Street one way with space for shared path
- Active Transport Link from Sunnyside Mill to Ballarat Train Station / CBD, including extension of loop trail to Sunnyside Mill with bridge / stepping rocks downstream of mill, fence along channel and revitalisation of Sunnyside Mill wetland

### South

- Opportunity to celebrate history of the Yarrowee River including transformation over the past 25 years, and cultural heritage including Wadawurrung people and gold mining. The Lookout (north of Prest Street) and Bala Street trailhead are two sites / projects that may be developed as part of the celebration.
- Erosion control works along CHW pond (separate project by COB/CHW. This a priority project due to risk of lagoon failure)

### Rural

- Glassons Road picnic area (in collaboration with Golden Plains Shire)
- Facilitate development of a loop trail at confluence of Union Jack Creek and Yarrowee River, including picnic facilities at Scotchmans Lead Road, small car park at Sykes Road, signage and revegetation – in collaboration with Napoleons Landcare Group
- Facilitate development of the Bridge to Bridge walk including fencing to correct title boundary, revegetation, trail and trailhead / picnic facilities at Buninyong – Mt Mercer Road bridge in collaboration with Garibaldi Landcare Group

### Eastern Tributaries

- Active Transport Link from Ballarat Netball car park at Llanberris Reserve to CBD
- Ballarat East loop and link trails and interpretation
- Indigenous theme trail along Grasstree Creek to Woowookarung (combine project with connections to Woowookarung)
- Dog park / pocket park at confluence of Warrenheip Gully and Canadian Creek

### Canadian Creek

- Upgrade Canadian Creek reserve south of Canadian Lakes
- Connections to Woowookarung Regional Park including trails and ecological corridors (combine project with Indigenous theme trail to Woowookarung)

### Union Jack Creek

- Facilitate revegetation at Somerville Road Reserve in collaboration with Leigh Catchment Group
- Facilitate / support riparian revegetation at De Soza Park in collaboration with community groups.
- Link trail between Geelong Road and Union Jack Reserve



# Priority Project 1

Trail heads, signage and interpretation

## Trail Head Vision:

The Dowcra Street Trail Head is a space to welcome people to the Yarrowee River Trail Network and provides facilities for trail users including generous, shady and safe carparking, picnic facilities and clear wayfinding information. It is the beginning of the proposed Yarrowee Kayak Trail

## Lookout Vision:

The lookout has been designed to highlight the Yarrowee River Valley to trail users and will encourage a moment to pause and reflect on the mining history of the River. It will also celebrate the past, present and future revegetation effort throughout the whole river corridor

Tell us your vision for the Yarrowee River corridor

Love walking along the river. More history signs would be a great addition. If people know more about the rivers history in relation to Ballarat's history they might feel more connected. A few more seats to rest these tired legs :- ) Keep up the good work

MySay Survey Nov. 2019

## Description

This Priority Project aims to increase the welcoming environment of the Yarrowee River Trail in the south and improve the experience for trail users.

### Dowcra Street Trail Head

The trail head project upgrades the existing carpark to develop a welcoming gateway to the Yarrowee River Trail. The formalised carpark reduces the existing gravel expanse and limits unwanted activity in the area. The proposed amenities including toilet, BBQ and picnic area will make the trail more user friendly and encourage extended use. The development of a wayfinding map and signage suite unifies the trail as a whole and provides important distance and destination information to pedestrians and cyclists. The revegetation improves amenity and shade at the carpark.

### Lookout

The lookout project is a small, low impact and low budget project to highlight the commencement of more works to come in the south of the Yarrowee. The location provides great views east and north/west of the river valley. The inclusion of some low planting and connecting paths improves amenity and establishes the lookout as a key feature along the trail. Interpretive signage displays information relating to the historic mining foundations and a celebration of past present and future restoration works along the Yarrowee River.

Refer following pages for PP1 Concept Plan.

## Suggested Staging

### Dowcra Street Trail Head

1. Fence re-alignment, carpark formalisation, tree planting and revegetation
2. Picnic area with shelter, BBQ and furniture
3. Signage - consider undertaking a full Yarrowee River wayfinding signage strategy as a separate project alongside this project to ensure consistency of signage along whole river corridor
4. Toilet block
5. Kayak Trail development

Lookout can be implemented as one whole project

## Project benefits

### Dowcra Street Trail Head

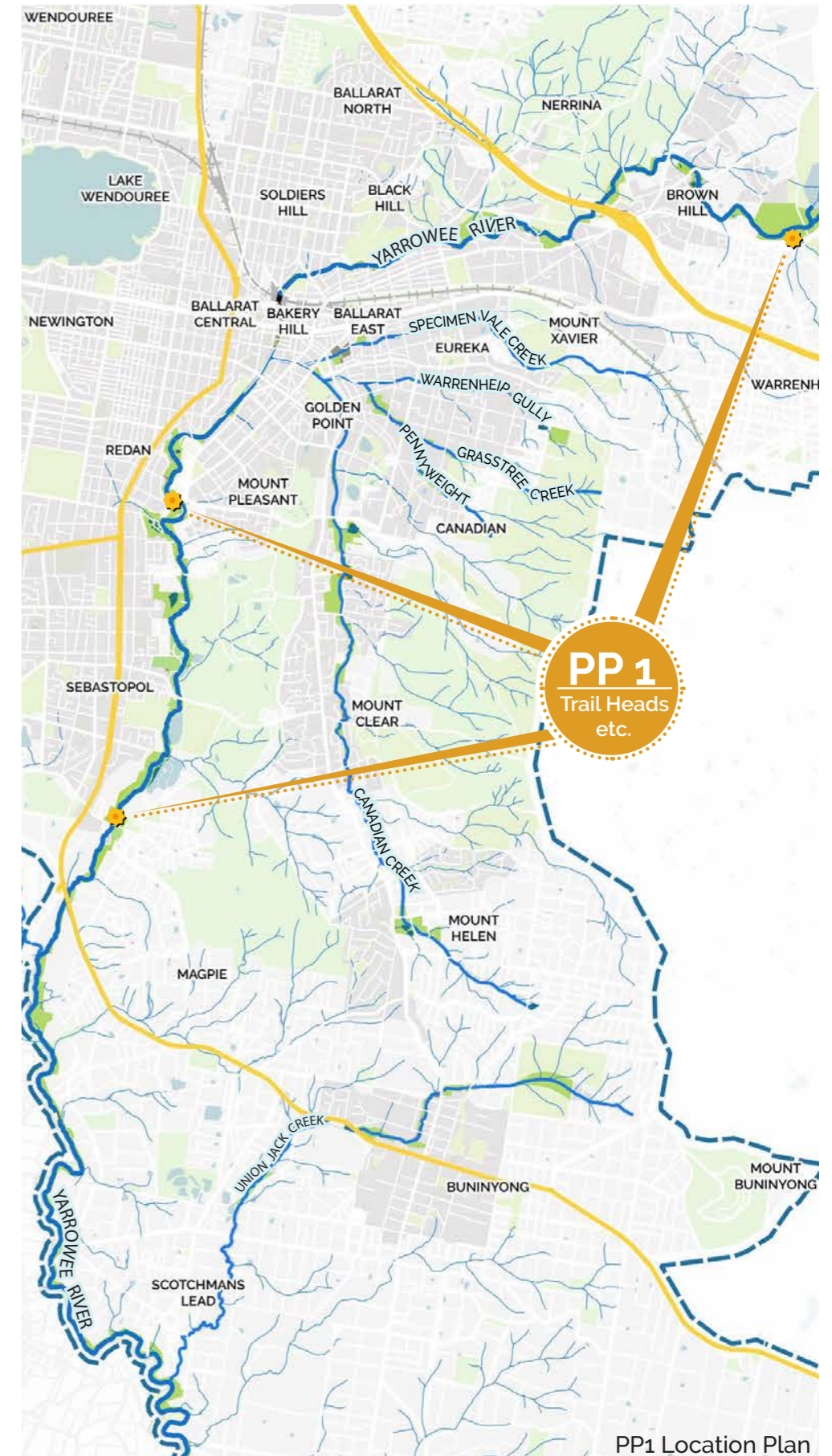
- Increases connection to the river trail for Sebastapol and Magpie residents and improve area liveability
- Encourages healthy lifestyle activities including walking, cycling and kayaking
- Provides one of only a few picnic areas and resting places along southern stretch of trail
- Encourages visitors to explore the southern river area

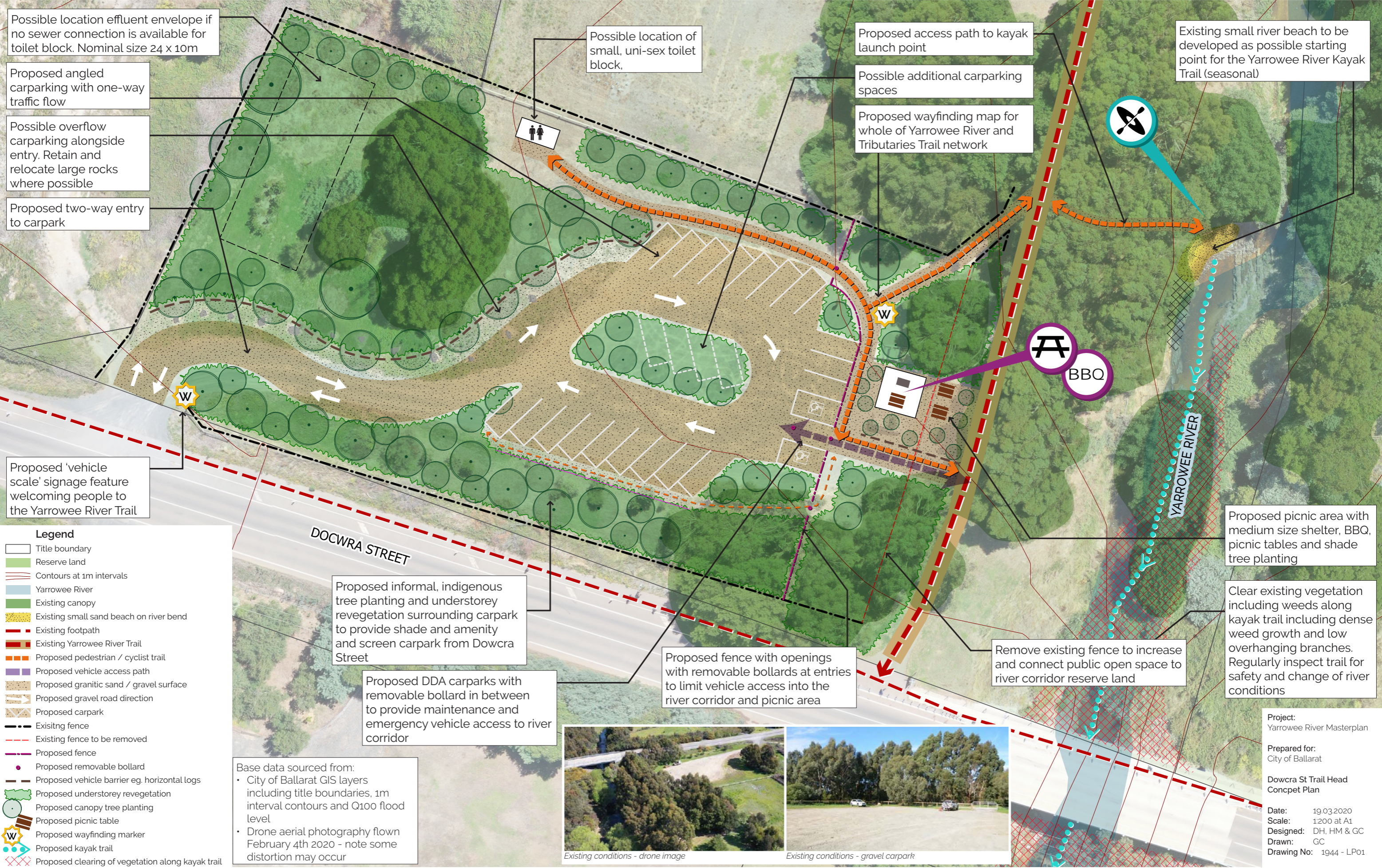
### Lookout

- Encourages visitors to visit the trail and learn more about Ballarat's history in an outdoor environment
- Acknowledges and celebrates past revegetation and restoration works

## Supporting documents

- Ballarat Open Space Strategy, 2008
- Ballarat Strategy 2040
- Ballarat Cycling Action Plan





# Yarrowee River Masterplan - Priority Project

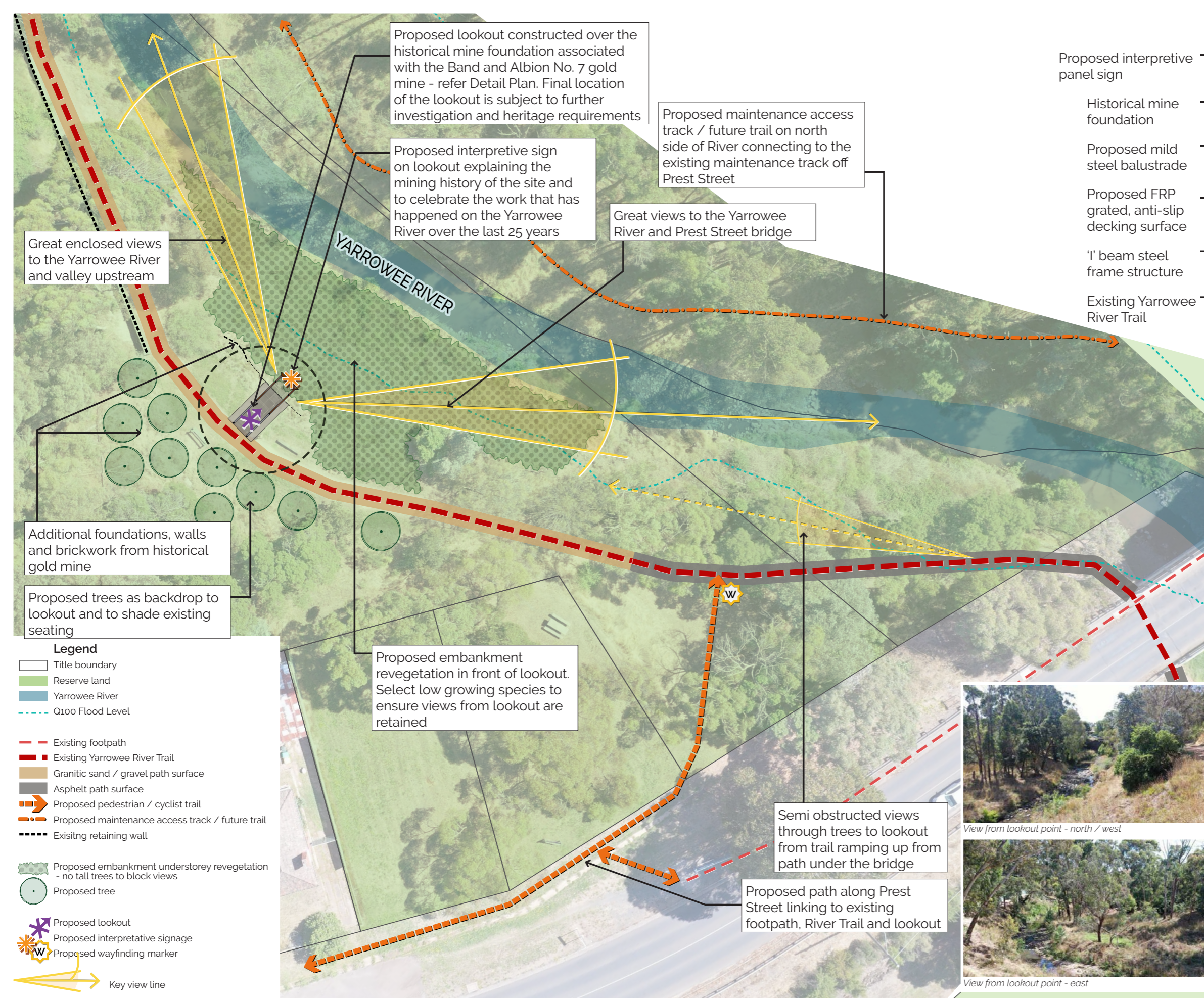
## Dowcra Street Trail Head

Scale 1:200 at A1 / 1:400 at A3

**THOMSON HAY**  
LANDSCAPE ARCHITECTS

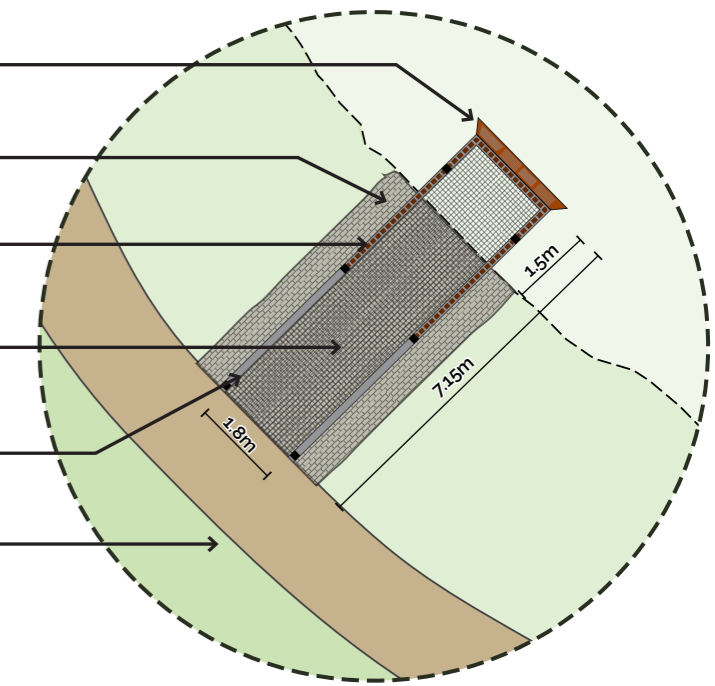
**PP 1a**  
Trail Heads etc.

130 Howards Road  
WATTLE FLAT VIC 3352  
T 03 5334 5321  
E office@thomsonhay.com  
W www.thomsonhay.com



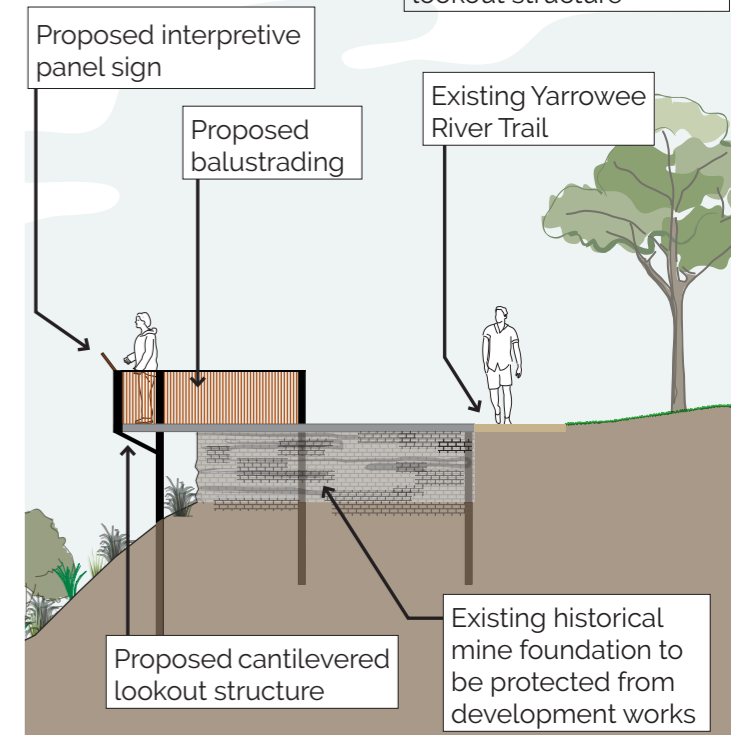
- Legend**
- Title boundary
  - Reserve land
  - Yarrowee River
  - Q100 Flood Level
  - Existing footpath
  - Existing Yarrowee River Trail
  - Granitic sand / gravel path surface
  - Asphalt path surface
  - Proposed pedestrian / cyclist trail
  - Proposed maintenance access track / future trail
  - Existing retaining wall
  - Proposed embankment understory revegetation - no tall trees to block views
  - Proposed tree
  - Proposed lookout
  - Proposed interpretive signage
  - Proposed wayfinding marker
  - Key view line

- Proposed interpretive panel sign
- Historical mine foundation
- Proposed mild steel balustrade
- Proposed FRP grated, anti-slip decking surface
- 'I' beam steel frame structure
- Existing Yarrowee River Trail



**LOOKOUT DETAIL PLAN**  
Scale 1:75 at A1

Note: further detailed design and structural engineering required for lookout structure



**LOOKOUT SECTION**  
Scale 1:75 at A1

Project: Yarrowee River Masterplan  
Prepared for: City of Ballarat



Base data sourced from:

- City of Ballarat GIS layers including title boundaries, reserve land and Q100 flood level
- Drone aerial photography flown February 4th 2020 - note some distortion may occur

Date: 16.03.2020  
Scale: 1:200 at A1  
Designed: DH / HM / GC  
Drawn: GC  
Drawing No: 1944 - LP02

**Yarrowee River Masterplan - Priority Project**  
Prest Street Lookout

Scale 1: 200 at A1 / 1:400 at A3

**THOMSON HAY**  
LANDSCAPE ARCHITECTS

**PP 1b**  
Trail Heads etc.

130 Howards Road  
WATTLE FLAT VIC 3352  
T 03 5334 5321  
E office@thomsonhay.com  
W www.thomsonhay.com

## Priority Project 2

### Sunnyside Mill Parkland

#### Vision:

*The design for the parkland at Sunnyside Mill will provide a comfortable, shady new path connection along the south/west side of the river channel. The rest node and carparking creates generous, shady facilities for trail users*

*The area south of the Sunnyside Mill has been designed to integrate with the current (private) development of the Mill building. The area will provide a space for the anticipated future increase of visitors, to use on a daily basis or for community events. Within the river, instream remediation and revegetation will improve water quality, wildlife habitat and amenity*

Tell us your vision for the Yarrowee River corridor

*Ballarat's green belt - A healthy, thriving biodiverse river corridor connecting surrounding urban areas and people with Ballarat's history, nature and places to be active. Please provide regular drink fountains.*

MySay Survey Dec. 2019

#### Description

The ongoing development of the Sunnyside Mill building has prompted the proposals along the adjoining river channel and reserve area. The proposals have been designed with the future increase of visitors in the area in mind. Continuing the trail along the south and east of the channel develops a significant loop trail and connects the Yarrowee River Trail to the Mill. The carpark upgrade encourages trail use and provides a test case for the Active Transport Link project. The ATL provides a carpark and connection to the trail and encourages a short walk or cycle into the Ballarat CBD. The rest node provides a point of pause on a long journey or a beginning point on a short trip. Wayfinding signage provides clear information for route planning. Further south, the renewal of the old, disused transfer station to develop a flexible open space, transforms the area to a usable green space with multiple possibilities for activities and events. The recommendation of an instream litter trap in a wider opening of the river will collect the large rubbish travelling from the upstream channel. River remediation and revegetation downstream of the end of the channel will improve water quality, habitat value and amenity and provide a test case for future southern river remediation.

Refer following pages for PP2 Concept plans

#### Suggested Staging

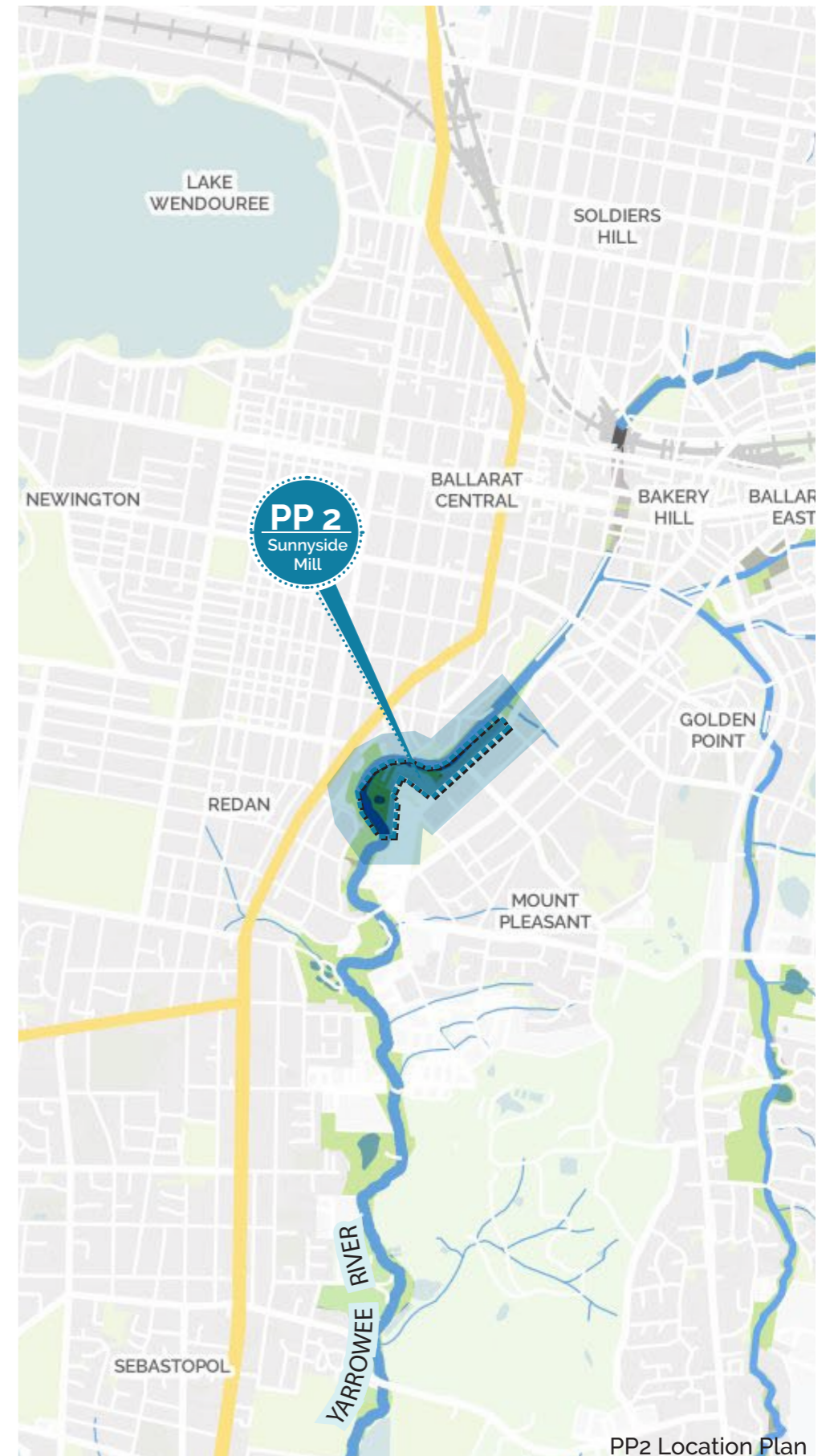
1. Eastern side of channel path extension including channel fence, canopy planting and revegetation  
Rest node with drinking fountain, bike repair station, wayfinding map and seating  
Active Transport Link carpark upgrade
2. Flexible open space mound
3. Litter trap and Bridge Crossing - including stabilised shared / maintenance path  
River remediation and aquatic and riparian planting
4. Hill Street Bridge railing restoration
5. Picnic shelter area and toilet block
6. Wetland development

#### Project benefits

- Encourages healthy lifestyle activities and promotes active connections to the Ballarat CBD and train station
- Provides park setting for the Mill development and encourages economic investment into the future opportunities
- Supports outdoor community events
- Improves water quality at the end of the channel with bank naturalisation and aquatic planting and encouraged aquatic regeneration downstream as plant material moves with the flow of water
- Cleans water of gross pollutants and minimises downstream maintenance

#### Supporting documents

- Ballarat City Integrated Water Management Plan, 2018
- Urban Forest Action Plan March 2019
- Ballarat Open Space Strategy, 2008



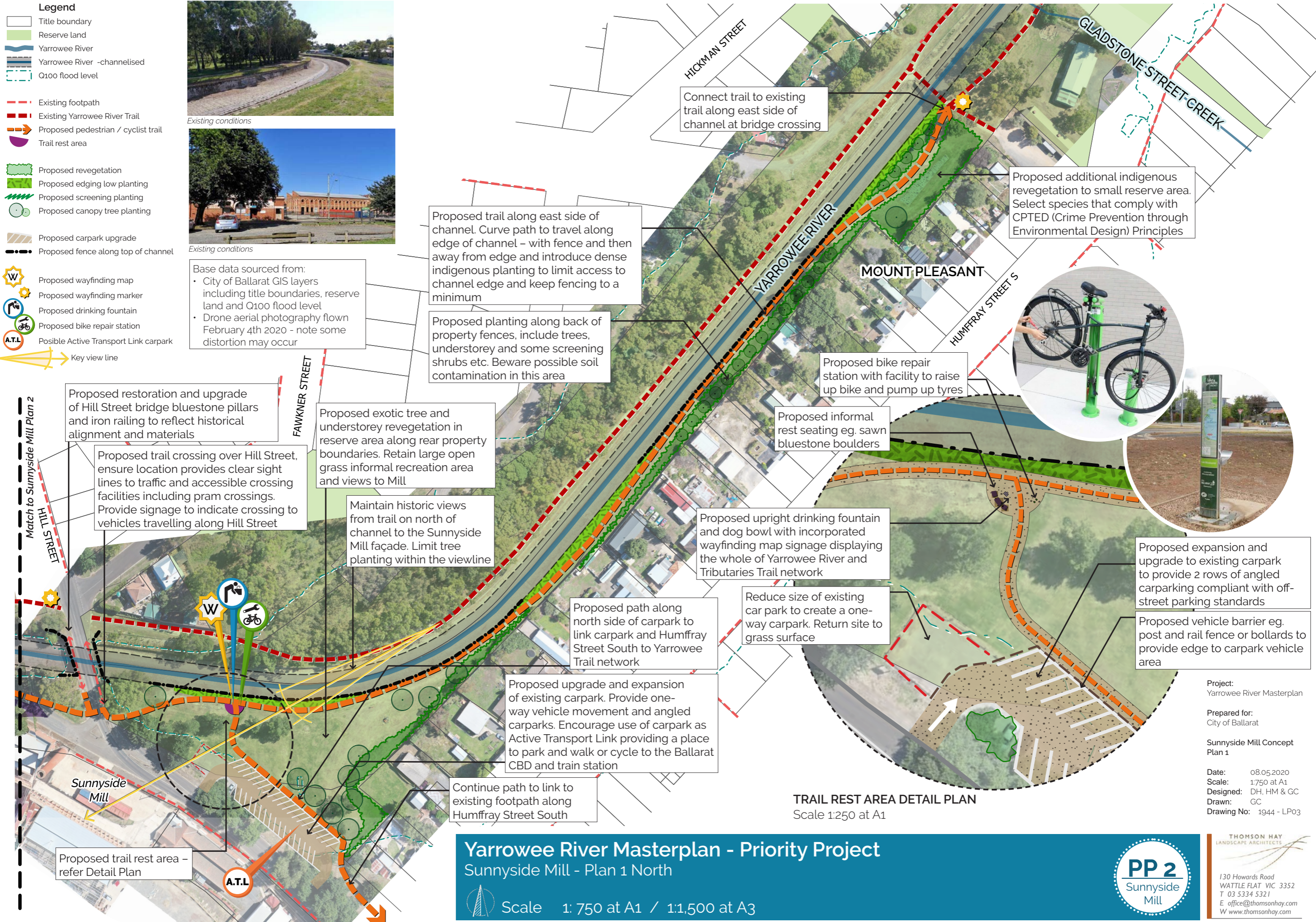
PP2 Location Plan

- Legend**
- Title boundary
  - Reserve land
  - Yarrowee River
  - Yarrowee River -channelised
  - Q100 flood level
  - Existing footpath
  - Existing Yarrowee River Trail
  - Proposed pedestrian / cyclist trail
  - Trail rest area
  - Proposed revegetation
  - Proposed edging low planting
  - Proposed screening planting
  - Proposed canopy tree planting
  - Proposed carpark upgrade
  - Proposed fence along top of channel
  - Proposed wayfinding map
  - Proposed wayfinding marker
  - Proposed drinking fountain
  - Proposed bike repair station
  - Possible Active Transport Link carpark
  - Key view line



Base data sourced from:

- City of Ballarat GIS layers including title boundaries, reserve land and Q100 flood level
- Drone aerial photography flown February 4th 2020 - note some distortion may occur



**TRAIL REST AREA DETAIL PLAN**  
Scale 1:250 at A1

Project: Yarrowee River Masterplan  
 Prepared for: City of Ballarat  
 Sunnyside Mill Concept Plan 1  
 Date: 08.05.2020  
 Scale: 1:750 at A1  
 Designed: DH, HM & GC  
 Drawn: GC  
 Drawing No: 1944 - LP03

**Yarrowee River Masterplan - Priority Project**  
 Sunnyside Mill - Plan 1 North

Scale 1: 750 at A1 / 1:1,500 at A3

**PP 2**  
Sunnyside Mill

THOMSON HAY  
LANDSCAPE ARCHITECTS

130 Howards Road  
WATTLE FLAT VIC 3352  
T 03 5334 5321  
E office@thomsonhay.com  
W www.thomsonhay.com



- Legend**
- Title boundary
  - Reserve land
  - Yarrowee River
  - Yarrowee River -channelised
  - Q100 flood level
  - Newly planted revegetation
  - Existing footpath
  - Existing Yarrowee River Trail
  - Proposed pedestrian / cyclist trail
  - Proposed vehicle access path
  - Proposed trail and maintenance path with heavy vehicle capacity
  - Proposed revegetation
  - Proposed embankment planting
  - Proposed screening planting
  - Proposed aquatic and riparian planting
  - Proposed irrigated grass mound
  - Proposed canopy tree planting
  - Proposed wetland upgrade
  - Opportunity to create wider pools in river
  - Water movement
  - Priority silt & sludge management
  - Possible land to be returned to river corridor reserve - requires negotiation with landowners
  - Proposed bridge river crossing
  - Existing fence
  - Proposed fence along top of channel
  - Proposed wayfinding marker
  - Proposed picnic area
  - Instream litter trap



Base data sourced from:

- City of Ballarat GIS layers including title boundaries, reserve land and Q100 flood level
- Drone aerial photography flown February 4th 2020 - note some distortion may occur

Existing decommissioned transfer station raised area to be redeveloped as flexible open space for various community events eg. markets, performances, small food truck festival or outdoor cinema. Make allowance to provide connection to services including power, water and consider sewer for future toilet block. Proposed soil cap over top subject to soil testing and evenly grade to create grassed mound area. East batter to path with steep grade will require filling and planting. South and west batters to be grass at max. 1:6 grade

Replace bluestone capping blocks along channel where missing

Development of Sunnyside Mill is currently in progress. Future uses of this site are likely to significantly increase the number of people using the Yarrowee River corridor

Retain existing vehicle access and continue track to end of channel

Opportunity to clear silt build up at end of channel. Widen river bed to create pool and provide bank stabilisation works to minimise scouring during high flow events

Proposed footpath traversing up mound to provide access up and along mound

Proposed shelter with picnic table and BBQ facilities along loop path

Proposed loop path along top of existing levee bank

Opportunity for instream bed and bank naturalisation including introducing pools, rock and riffles. Revegetation of riparian and aquatic zone and focussed remediation of the river will enhance water quality, wildlife habitat and amenity. Continue this treatment from end of channel to Prest Street (approx. 850m). In time, riparian and aquatic plant species seeds will travel further downstream and improve the river corridor throughout the south and rural sections of the Yarrowee

Retain good view lines from levee bank, over wetland to Sunnyside Mill chimney

Proposed bridge crossing over Yarrowee River to link path to existing west bank trail

Proposed instream litter trap. Location subject to feasibility study, flow rates etc.

Existing feature fence with silhouette cut out shapes to Sunnyside Mill boundary

Explore opportunities to divert adjoining streetscape stormwater and work with adjoining property owners to redirect a higher volume of water into the basin to increase water level and provide more permanent water. Consider increasing capacity by creating a deeper basin and widening shape of basin to the north/west. Consider introducing additional off-stream Water Sensitive Urban Design principles to the basin to develop a wetland, incorporating sediment ponds, planted batters and swales. Wetland development subject to catchment analysis water volume engineering design

Proposed 3m wide pedestrian and cyclist path with reinforced base to allow for heavy vehicle maintenance access to proposed litter trap (refer Pilot Project 3 - Litter Trap)

Possible path connection continuing along east bank to connect to Tannery Lane path and bridge downstream - subject to landowner consultation

Consider opportunity to improve river corridor and provide trail connection on east side of river with weed control and vegetation buffer by obtaining private land alongside river. Subject to negotiations with landowners

Project: Yarrowee River Masterplan  
 Prepared for: City of Ballarat  
 Sunnyside Mill Concept Plan 2  
 Date: 08.05.2020  
 Scale: 1:750 at A1  
 Designed: DH, HM & GC  
 Drawn: GC  
 Drawing No: 1944 - LP04

# Yarrowee River Masterplan - Priority Project

## Sunnyside Mill - Plan 2 South

Scale 1: 750 at A1 / 1:1,500 at A3



**THOMSON HAY**  
 LANDSCAPE ARCHITECTS  
 130 Howards Road  
 WATTLE FLAT VIC 3352  
 T 03 5334 5321  
 E office@thomsonhay.com  
 W www.thomsonhay.com

# Priority Project 3

## Revitalisation of Redan Wetlands

### Vision:

*The concept design for the Redan Wetlands aims to increase water quantity which in turn will improve aquatic species diversity and extent and an ultimate improvement in water quality. The benefits of the wetland reserve improvements will lead to improved wildlife habitat and landscape amenity.*

*The pedestrian access through the site will be improved and a rest node with interpretive signage will improve user experience. A higher level of ongoing maintenance is required to ensure the correct functioning of the wetland system.*

Tell us your vision for the Yarrowee River corridor

*I believe all sectors of management authorities should strive to ameliorate the river corridor by weed eradication, and restoration of native riparian vegetation communities to improve the habitat quality to better support native biodiversity.*

MySay Survey Nov. 2019

*More emphasis on environmental outcomes / Control of erosion and weeds / More tree planting / Restoration of natural flow patterns (eg, wetlands) / Support for a local Waterwatch program*

MySay Survey Dec. 2019

### Description

The Redan Wetland Revitalisation project is about improving a great example of early Water Sensitive Urban Design (WSUD) works and upgrading the facilities within the reserve. The structure of a comprehensive wetland is already in place, however, limited infrastructure maintenance and inconsistent water levels have degraded the area since it was constructed in 2001. Firstly a full engineering assessment to investigate functionality, capacity and infrastructure is required. Once engineering design and construction works are complete, including de-silting ponds, works to improve user experience such as path upgrades, introducing canopy trees and a lookout shelter area have been proposed.

The Yarrowee River adjacent to the wetlands is degraded. The second part of this project is to improve this stretch of river to showcase the benefits of using wetlands to decontaminate stormwater before it enters the river. Proposed bridges cross the river along the Yarrowee Trail and create a loop path and an opportunity to showcase the symbiotic relationship of the wetlands and river.

Refer following page for PP3 Concept plan

### Suggested Staging

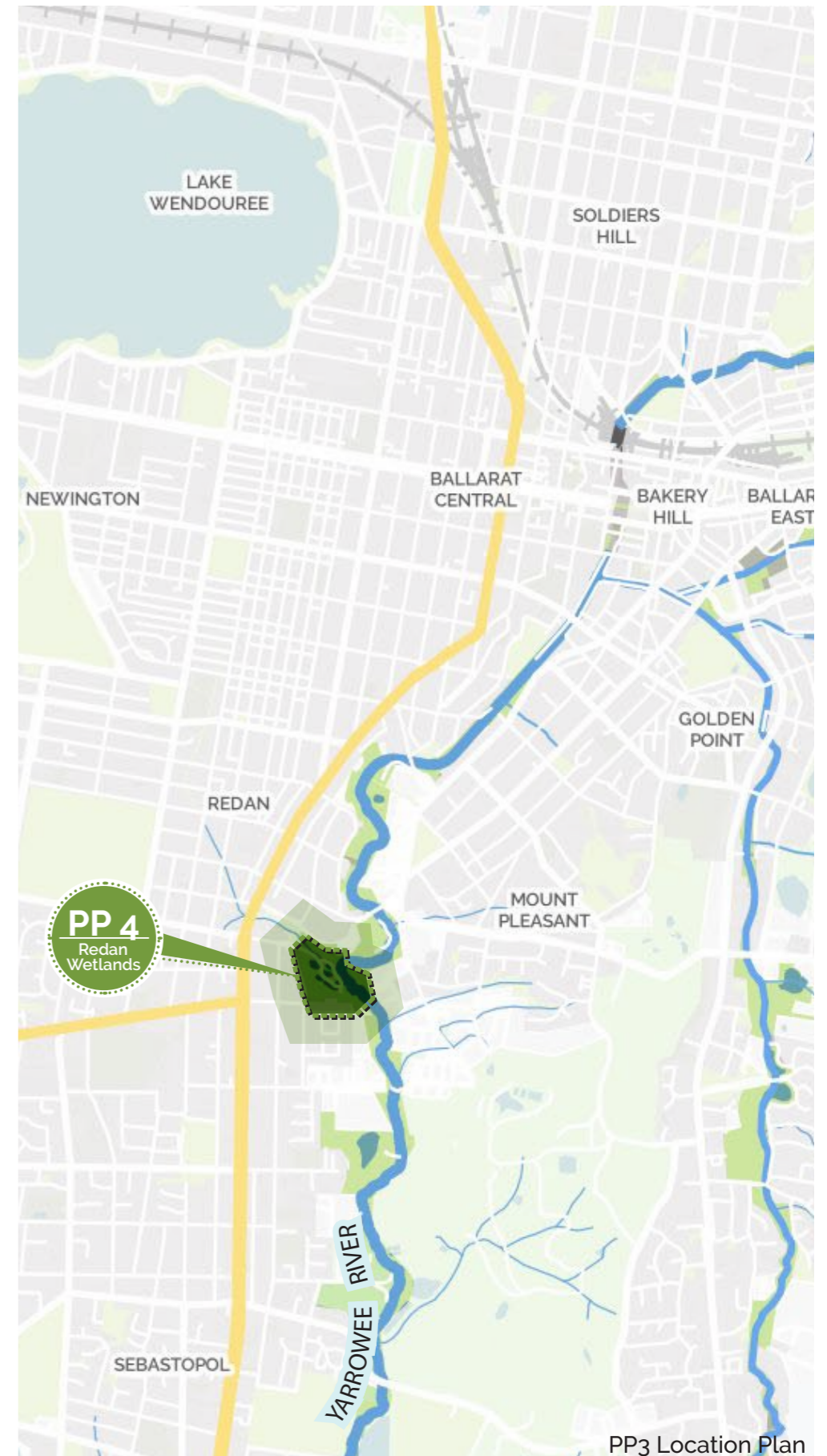
1. Wetland remediation including engineering assessment, de-silting, litter removal, management of water levels and infill wetland planting
2. Path surface upgrade and boardwalks
3. Canopy tree planting and revegetation
4. Embankment revegetation
5. Picnic shelter lookout and upgrade to existing jetty
6. Bridges and path link to east side of Yarrowee river including river remediation, erosion control and aquatic and riparian revegetation

### Project benefits

- Improves stormwater quality before entry to the Yarrowee River system
- Creates a trail destination and encourages people to visit the area
- Improves habitat value of area for a diverse selection of local wildlife
- Educates visitors on the benefits and process of treating stormwater
- Provides extensive canopy cover and bank stabilisation revegetation
- Develops loop trails and encourages healthy lifestyle activities
- 

### Supporting documents

- Breathing Life into the Yarrowee River Project, 2013
- Corangamite Waterway Strategy 2014-2022 (Corangamite CMA)
- Upper Barwon Yarrowee Leigh FLOWS study update, 2019 (Corangamite CMA)
- Ballarat City Integrated Water Management Plan, 2018
- Leigh Catchment Group Strategy 2017-2023 (Leigh Catchment Group)
- Greening Ballarat - a Green-Blue Action Plan, 2016
- Urban Forest Action Plan March 2019
- Ballarat Open Space Strategy, 2008



PP3 Location Plan

This is a concept plan only and should be further developed in conjunction with an engineering review of the functionality, capacity, water levels and quantities and infrastructure of the whole system

Retain existing bridge over Redan Creek

Retain fire access path

Proposed embankment planting including canopy trees and understorey planting will enhance amenity and reduce ongoing maintenance. Planting extent subject to a Bushfire Management Statement

Proposed upgrade to existing small jetty

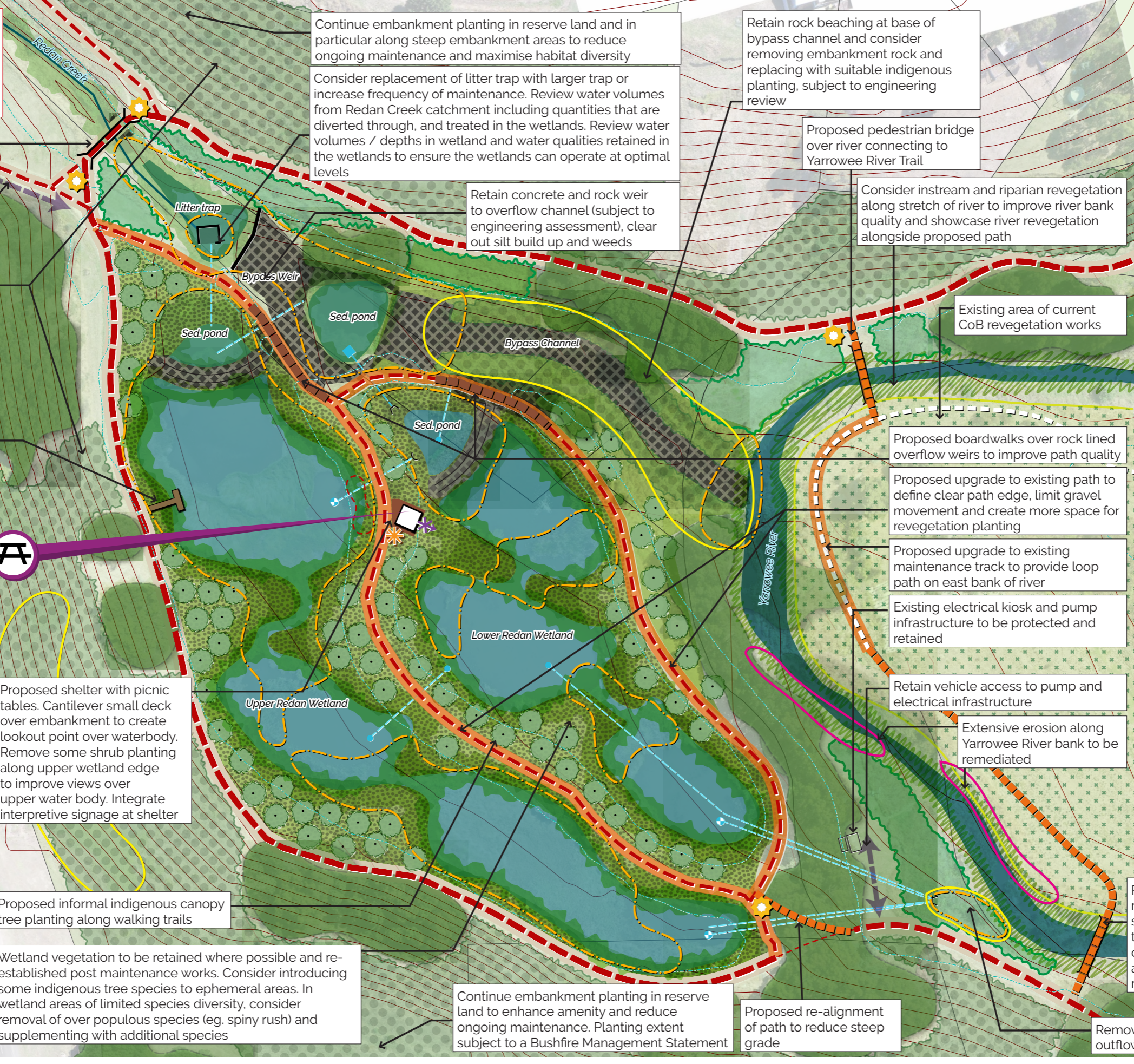
- Legend**
- Title boundary
  - Reserve land
  - Contours at 1m intervals
  - Yarrowee River
  - Q100 flood level
  - Existing canopy
  - Existing revegetation
  - Wetland water body
  - Existing rock beaching to be retained
  - Wetland pipe infrastructure
  - Wetland rising main

- Maintain existing vehicle access path
- Existing footpath
- Existing maintenance track
- Existing Yarrowee River Trail
- Proposed pedestrian / cyclist trail
- Proposed boardwalk
- Proposed upgrade to existing footpath

- Priority weed management
- Priority erosion control
- Priority silt and litter management

- Proposed understorey revegetation
- Proposed embankment revegetation
- Proposed wetland batter planting
- Proposed aquatic and riparian planting
- Proposed canopy tree planting

- Proposed picnic area
- Proposed wayfinding marker
- Proposed interpretative signage / feature
- Proposed lookout



Continue embankment planting in reserve land and in particular along steep embankment areas to reduce ongoing maintenance and maximise habitat diversity

Consider replacement of litter trap with larger trap or increase frequency of maintenance. Review water volumes from Redan Creek catchment including quantities that are diverted through, and treated in the wetlands. Review water volumes / depths in wetland and water qualities retained in the wetlands to ensure the wetlands can operate at optimal levels

Retain concrete and rock weir to overflow channel (subject to engineering assessment), clear out silt build up and weeds

Retain rock beaching at base of bypass channel and consider removing embankment rock and replacing with suitable indigenous planting, subject to engineering review

Proposed pedestrian bridge over river connecting to Yarrowee River Trail

Consider instream and riparian revegetation along stretch of river to improve river bank quality and showcase river revegetation alongside proposed path

Existing area of current CoB revegetation works

Proposed boardwalks over rock lined overflow weirs to improve path quality

Proposed upgrade to existing path to define clear path edge, limit gravel movement and create more space for revegetation planting

Proposed upgrade to existing maintenance track to provide loop path on east bank of river

Existing electrical kiosk and pump infrastructure to be protected and retained

Retain vehicle access to pump and electrical infrastructure

Extensive erosion along Yarrowee River bank to be remediated

Proposed shelter with picnic tables. Cantilever small deck over embankment to create lookout point over waterbody. Remove some shrub planting along upper wetland edge to improve views over upper water body. Integrate interpretive signage at shelter

Proposed informal indigenous canopy tree planting along walking trails

Wetland vegetation to be retained where possible and re-established post maintenance works. Consider introducing some indigenous tree species to ephemeral areas. In wetland areas of limited species diversity, consider removal of over populous species (eg. spiny rush) and supplementing with additional species

Continue embankment planting in reserve land to enhance amenity and reduce ongoing maintenance. Planting extent subject to a Bushfire Management Statement

Proposed re-alignment of path to reduce steep grade

Remove weeds and silt from outflow to Yarrowee River pool

- EXISTING CONDITIONS**
- Existing litter trap appears ineffective as it is full of silt and rubbish and appears to be causing consequent problems to the rest of the wetland system.
  - Sedimentary basins for each of the upper, lower and bypass channel systems appear full of silt and have poor water quantity and quality.
  - Upper Redan Wetland has large quantities of silt and litter and the water quality is poor. The water level is low due to pumping water to Lake Wendouree and has impacted the quality and diversity of plant species.
  - Lower Redan Wetland appears to be functioning better than the upper wetland, however there are still large areas of silt build-up. There is a wider range of plant diversity and less litter.
  - Bypass Channel is fully rock lined with a high volume of weed species and some exotic trees. Limited space is available for planting and it has become an eyesore due to the difficulty of managing this hard to access area.
  - Path condition throughout the wetlands is relatively good however the central paths traverse over rock lined overflow weirs which is uncomfortable to walk on and limits access.
  - Vegetation is patchy and canopy trees are limited and rarely providing shade over paths.
  - Wetland vegetation is good in some places with high diversity. Spiny Rush has become dominant and dense in some areas due to low water levels.
- In general greater focus should be provided to the maintenance of the entire wetland system



Existing conditions

- Base data sourced from:
- City of Ballarat GIS layers including title boundaries, 1m interval contours and Q100 flood level
  - Drone aerial photography flown February 4th 2020 - note some distortion may occur
  - City of Ballarat - Yarrowee - Redan Wetlands Earthworks and Ancillary Works Construction Plans 2000 (see Report Appendix)

**Project:**  
Yarrowee River Masterplan

**Prepared for:**  
City of Ballarat

**Redan Wetlands Concept Plan**

**Date:** 08.05.2020  
**Scale:** 1:500 at A1  
**Designed:** DH / GC  
**Drawn:** GC  
**Drawing No:** 1944 - LP05

# Yarrowee River Masterplan - Priority Project

## Redan Wetlands Upgrade

Scale 1: 500 at A1 / 1:1000 at A3



**THOMSON HAY**  
LANDSCAPE ARCHITECTS

130 Howards Road  
WATTLE FLAT VIC 3352  
T 03 5334 5321  
E office@thomsonhay.com  
W www.thomsonhay.com

## Priority Project 4

### Rural Trail Extension - Dowcra Street to Midland Highway

#### Vision:

*The rural extension of the Yarrowee Trail network will provide a continuous connection into Ballarat with longer trail loops for existing and future residents in the area. The development of a seasonal Yarrowee Kayak Trail along a significant stretch of the river will provide an alternative recreational activity. Increased vegetation, instream remediation and expanding the river corridor will increase habitat and landscape amenity*

#### Description

The rural trail extension project is the first stage of a long term aim to develop a trail continuously along the Yarrowee River - from the north to south. This project is a pilot for improving the land alongside the river in rural areas. Much of the adjacent land is covered by various land management licences that will need to be rescinded as required to develop new sections of trail. Some adjacent land is privately owned. Landholder negotiation will be required for land acquisitions to create a continuous reserve along the river.

An off stream billabong provides an opportunity to revegetate and develop a natural feature of the rural reach of the Yarrowee River and to celebrate the beginning of the trail extension. There is opportunity for partnership with the nearby Magpie Primary School to establish educational programs including planting days to encourage community participation and education.

The plan provides the opportunity for a test case for the development of a seasonal Yarrowee Kayak trail. The meandering stretch of river is a good depth and provides decent flow rates most of the year. In future the trail will extend further south and establish multiple launch and dismount points.

Refer following page for PP4 Concept plan

#### Suggested Staging

1. Trail extension to Midland Highway including fencing
2. Revegetation along reserve land
3. Billabong development including revegetation, paths and boardwalk
4. River remediation and aquatic and riparian revegetation
5. Link along Aubreys Road including revegetation
6. Kayak Trail including Midland Highway carpark and path under bridge

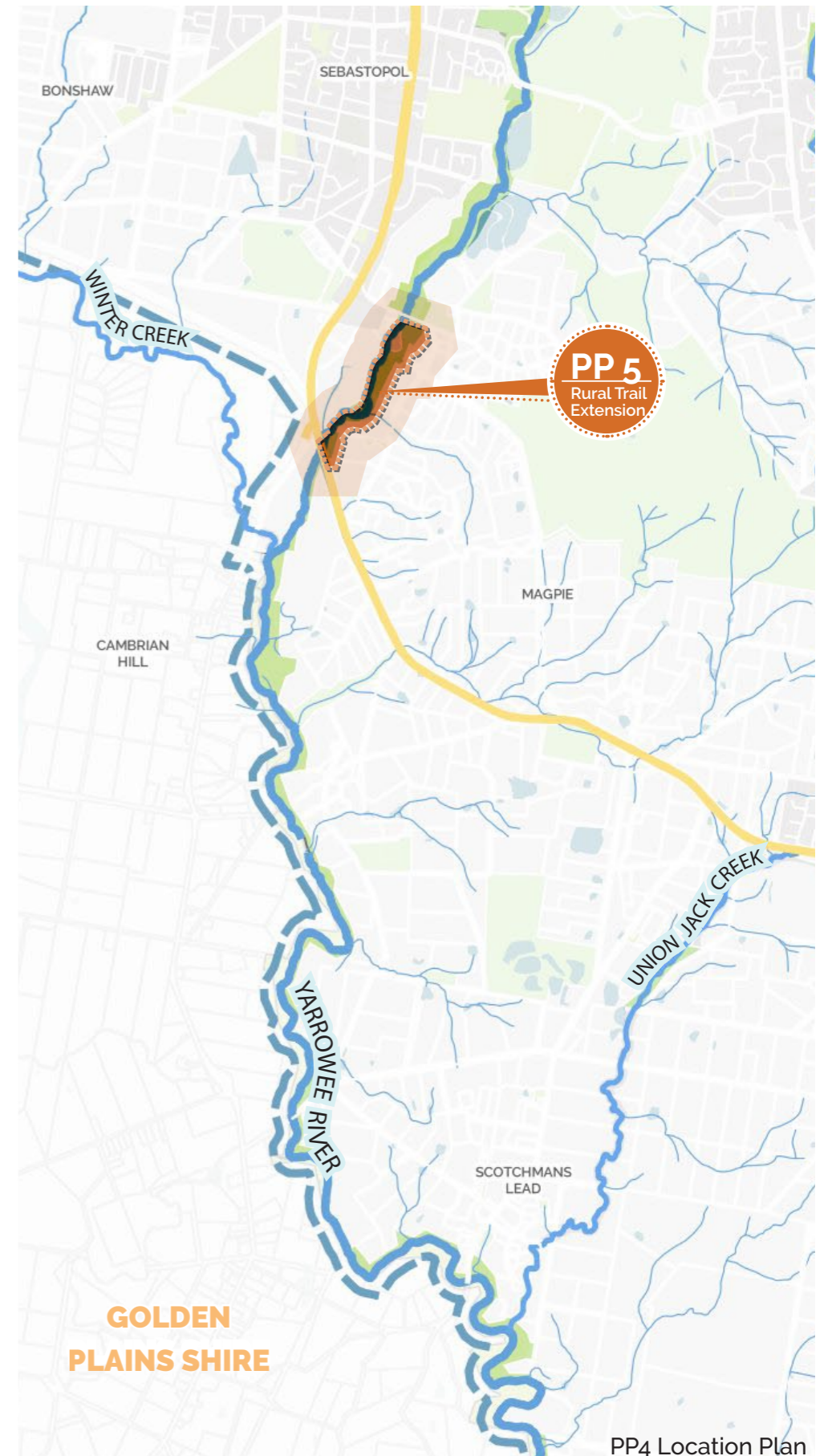
Negotiate land acquisition as appropriate with local landholders

#### Project benefits

- Encourages healthy lifestyle activities including walking, cycling and kayaking and develops loop trail opportunity
- Improves water quality before entering to Yarrowee River system
- Regenerates indigenous vegetation on pastoral land
- Provides continual indigenous canopy cover along trail
- Engages children in ecological education opportunities
- Supports improved public open space for future housing development in the south of CoB

#### Supporting documents

- Corangamite Waterway Strategy 2014-2022 (Corangamite CMA)
- Breathing Life into the Yarrowee River Project, 2013

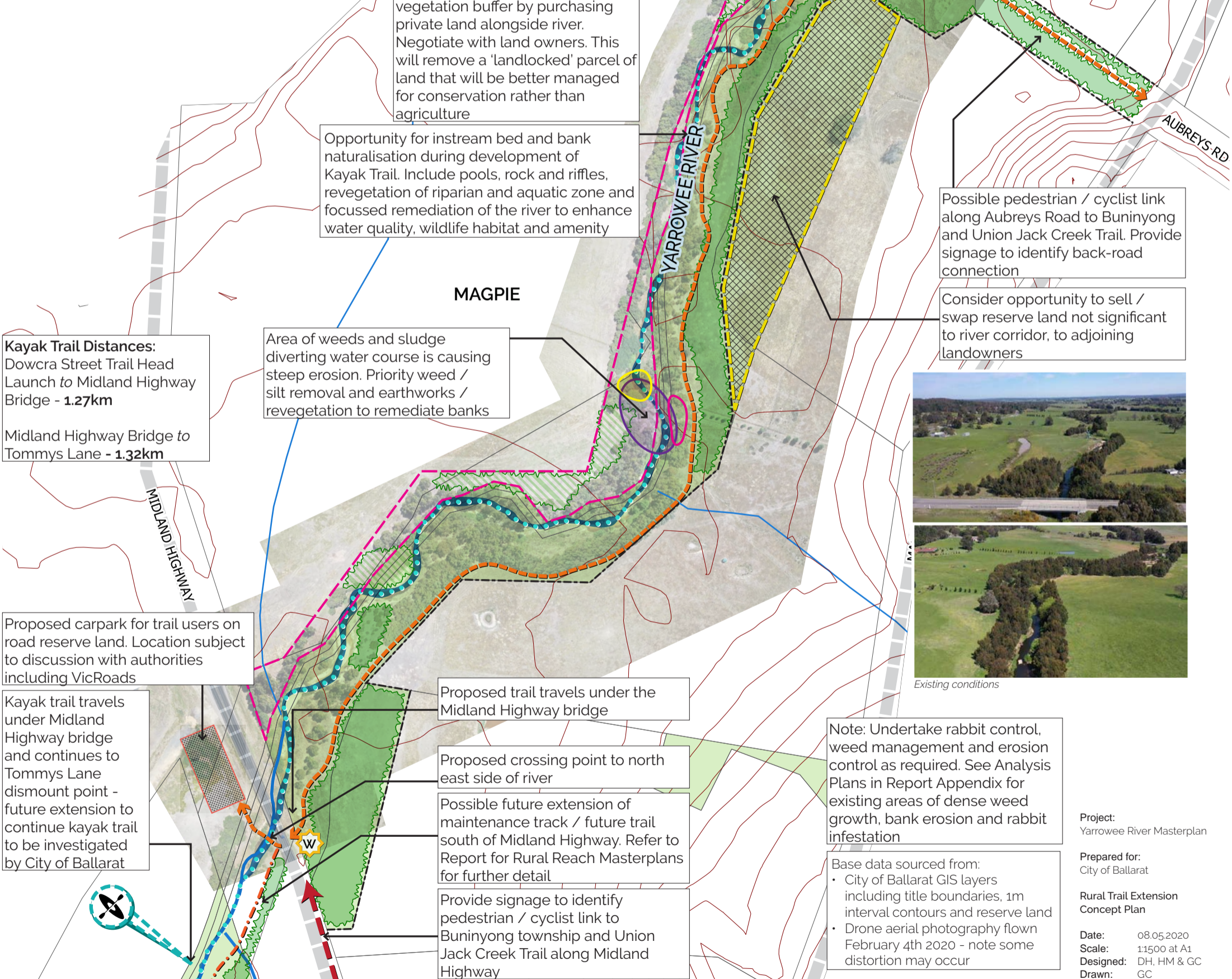


Tell us your vision for the Yarrowee River corridor

*Would be great to have it fixed up and allow an annual walking event from Ballarat to Buningyong for charity.*

MySay Survey Nov. 2019

- Legend**
- Title boundary
  - Reserve land
  - Contours at 1m intervals
  - Yarrowee River
  - Existing road
  - Existing footpath
  - Existing Yarrowee River Trail
  - Proposed pedestrian / cyclist trail
  - Proposed boardwalk
  - Proposed road crossing - pram crossing & signage
  - Proposed maintenance access track / future trail
  - Improve pedestrian / cyclist link
  - Proposed fence to title boundary
  - Possible land to be returned to river corridor reserve - requires negotiation with landowners
  - Reserve land - possible private land
  - Proposed canopy and understorey revegetation
  - Proposed riparian planting along bilabong
  - Proposed revegetation in private land
  - Priority weed management
  - Priority erosion control
  - Priority sludge management
  - Proposed wayfinding marker
  - Proposed interpretative signage / feature
  - Opportunity for water interaction
  - Possible kayak launch / dismount point
  - Kayak trail



**Kayak Trail Distances:**  
 Dowcra Street Trail Head Launch to Midland Highway Bridge - **1.27km**  
 Midland Highway Bridge to Tommys Lane - **1.32km**



**Note:** Undertake rabbit control, weed management and erosion control as required. See Analysis Plans in Report Appendix for existing areas of dense weed growth, bank erosion and rabbit infestation

Base data sourced from:  
 • City of Ballarat GIS layers including title boundaries, 1m interval contours and reserve land  
 • Drone aerial photography flown February 4th 2020 - note some distortion may occur

**Project:**  
Yarrowee River Masterplan

**Prepared for:**  
City of Ballarat

**Rural Trail Extension Concept Plan**

**Date:** 08.05.2020  
**Scale:** 1:1500 at A1  
**Designed:** DH, HM & GC  
**Drawn:** GC  
**Drawing No:** 1944 - LP06

# Yarrowee River Masterplan - Priority Project

## Rural Trail Extension

### Dowcra Street to Midland Highway

Scale 1: 1500 at A1 / 1:3000 at A3



**THOMSON HAY**  
 LANDSCAPE ARCHITECTS

130 Howards Road  
 WATTLE FLAT VIC 3352  
 T 03 5334 5321  
 E office@thomsonhay.com  
 W www.thomsonhay.com



# Loop Paths and Links

## Connecting Ballarat via river and creek corridors

The Yarrowee River and connecting tributaries provide a natural spine of mostly undeveloped land often within adjacent green space. This plan identifies existing trails within the corridor, including the Yarrowee Trail, and missing links or opportunities to improve pedestrian and cyclist loops and connections throughout Ballarat and surrounds. Reach Masterplans provide detailed information of proposed loops and links along river and creek corridors.

The development of small - medium scale loop paths around features of interest or in urban areas, such as East Ballarat, encourage local walking and allows a wide range of users to choose the walk length and experience that best suits them. Creating larger scale loops for longer rides / walks between suburbs and smaller townships in the region for more active users, promotes a healthy lifestyle in Ballarat. Longer loop trails may be a day trip length and should provide high quality visitor infrastructure and experiences. Longer loops may also be used as routes for running / cycle events.

### Trail Heads

Proposed Trail Heads create key access points along the trail network and provide places to meet, review and commence a walk, run or ride with features to facilitate an easy journey. Trail Head areas include features such as carparks, picnic facilities, toilets, drinking fountains, bike repair stations, possible play spaces and signage. The signage provides clear wayfinding /directional, safety and compliance information on possible routes including distances and destinations along the trail network.

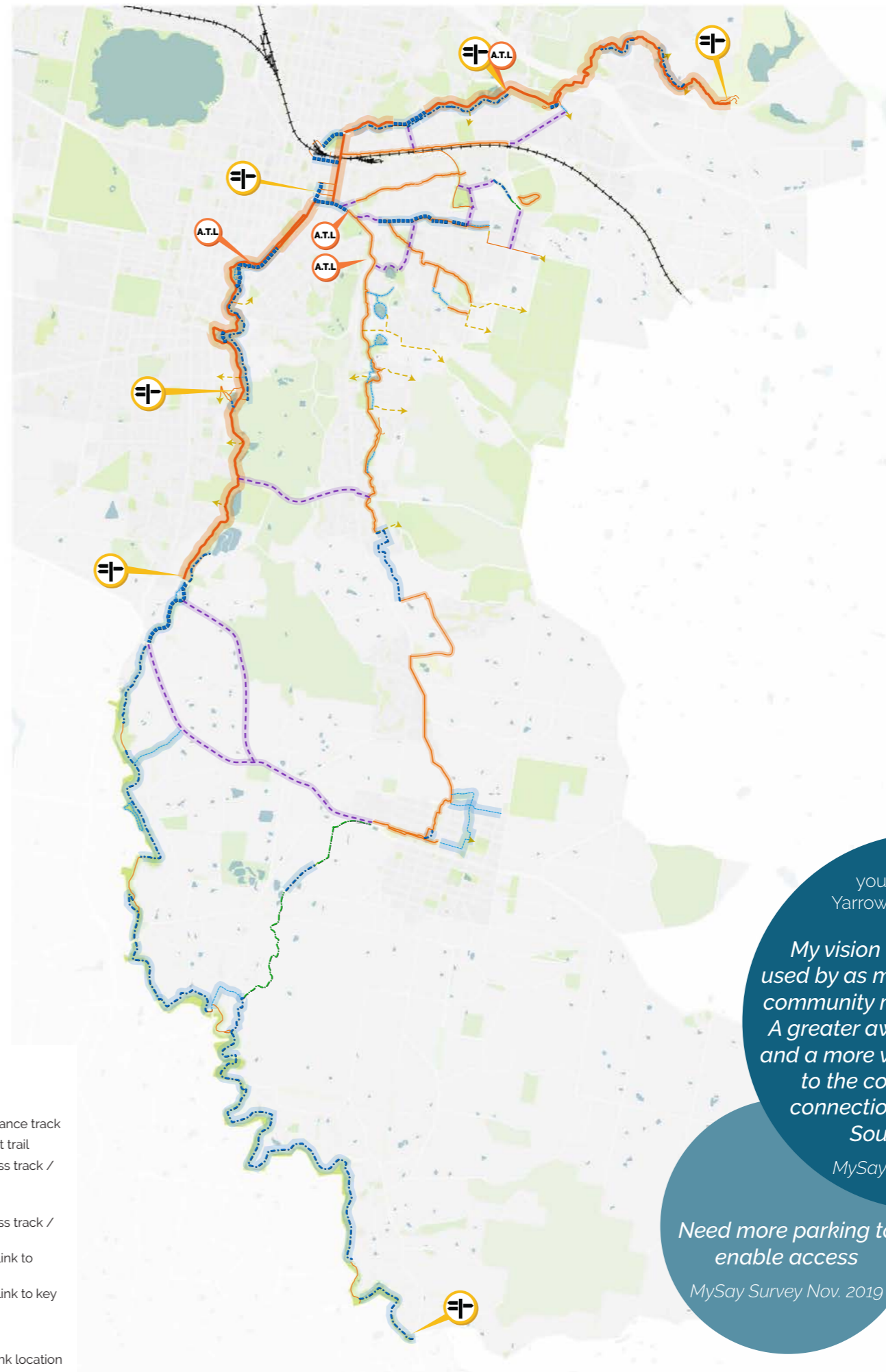
### Active Transport Links

Active Transport Links recommend pedestrian and cycle trail infrastructure that allows people to park outside the CBD and walk / ride along the Yarrowee River Trail into the CBD and connect people to the train station, schools, shops and services. Features of the Active Transport Link include a carpark and may include bike repair stations, drinking fountains, signage / branding, canopy tree planting and path edge planting. Upgrade of existing trails or development of new trails may be required

### Walk and Cycle Maps

The development of a trail map / brochure for the Yarrowee River and tributaries loop trails will encourage visitors to explore Ballarat's Waterways. Indication of distances and durations as well as showcasing destinations including key features, tourism locations and local businesses will promote the region. The maps should be made available at the Visitor Information Centre and digital version online for visitors to plan their journey in advance.

- Legend**
- Existing Yarrowee River Trail
  - Existing named trail
  - Existing minor trail / maintenance track
  - Proposed pedestrian / cyclist trail
  - Proposed maintenance access track / future trail
  - Proposed minor path
  - Proposed maintenance access track / future trail on private land
  - Improve access & re-inforce link to create loop trail
  - Improve access & re-inforce link to key destination
  - Proposed Trail Head location
  - Proposed Active Transport Link location



Tell us  
your vision for the  
Yarrowee River corridor

*My vision that the corridor is used by as many user groups and community members as possible. A greater awareness of the trails and a more visible way to connect to the corridor and for the connection of the North and South corridors.*

MySay Survey Nov. 2019

*Need more parking to enable access*

MySay Survey Nov. 2019



Yarrowee River Northern Reach



Yarrowee River, looking south with Hillview Road in the mid ground



# Yarrowee River - Northern Reach

## Landscape character and general conditions

The northern reach of the Yarrowee River starts from Gong Gong Reservoir and flows through the north eastern suburbs of Ballarat including Gong Gong, Nerrina, Brown Hill, Black Hill and Ballarat East; up to the start of the channelised section near Eastern Oval.

The river corridor feels most natural in the upper reach, with generally a wide reserve (total width varies between 24 – 160m, average width is 70m). There are rocky outcrops (granite and sandstone), extensive remnant indigenous vegetation, dense tree canopy, relatively intact instream vegetation, and undulating topography with surrounding hills and gullies. Adjoining housing / development is generally well set back from the river.

Many reserves adjoin the Yarrowee River corridor, including Kirks and Gong Gong Reservoir Parks, Ditchfield Bushland Reserve, Monte Christo Bushland Reserve, Brown Hill Reserve, Black Hill Reserve, Chisholm Street Reserve and Nerrina Wetlands Reserve. These reserves provide for a range of passive and active recreation activities and events, including Mountain Biking trails at Black Hill, sports fields and playgrounds at Brown Hill, bird watching at Ditchfield and visitor facilities for picnics and events in the gardens at Kirks and Gong Gong Reservoirs.

The Yarrowee River trail starts / ends at the Gong Gong Reservoir and is well used by walkers, runners and cyclists. The trail goes through a tunnel under the Western Freeway and continues up to Eastern Oval. The trail surface is mostly granitic sand, with some sections of asphalt or gravel, and some sections on local roads (in Black Hill area). Some signage is provided along the trail including trailhead signage at Gong Gong Reservoir, and some interpretive signage at key locations about local flora and fauna.

EVC's in the northern reach are mostly Valley Grassy Forest and Herb-rich Foothill Forest, with small intrusions of Heathy Dry Forest. Ditchfield Bushland Reserve is an area of high quality natural vegetation. Planted indigenous species have been added in places. Indigenous remaining vegetation includes a few fern species upstream of Brown Hill.

The established residential areas in the northern reach have a distinctive neighbourhood character with larger residential allotments and an extensive canopy of native trees. The forecast population growth for Brown Hill is 60% over the next 20 years (refer to BHL). Proposed infill housing developments in the northern reach of the Yarrowee River need careful planning to ensure they do not adversely affect the values of the river corridor.

## Assessment of the 1995 Masterplan

The river corridor has seen a successful transformation since the original masterplan, from a weed infested swamp to a valuable environmental and recreational asset.

Extensive works have been undertaken including:

- weed removal and control,
- revegetation of canopy trees and understorey,
- development of the Nerrina Wetlands and smaller offline ponds to improve stormwater management and quality.
- construction of trails for walking, cycling and maintenance access, and
- the Wattle Flat – Pootilla Landcare Group have done great work maintaining the Ditchfield Bushland Reserve.

Riparian planting from the LINC'S project has restored a natural-looking environment wherever it has occurred from Black Hill to upstream of Brown Hill.

The condition of much of the river before the 1995 masterplan can be seen along stretches of the south bank of the river between Ainley and Stawell Streets where thick growth of weedy grasses and other exotic vegetation dominates. This is a clear demonstration of the change, and also indicates that there is more opportunity for planting in some sections. Due to the extent and age of the combined environmental works, the northern reach should be used as a model for future development of the river /creek corridor elsewhere.



Asphalt path in the Yarrowee River corridor



Ditchfield Reserve



Typical northern reach bridge



Yarrowee River under freeway



Granitic sand path



Offline wetland



Brown Hill Reserve



Nerrina Wetlands

## Overview of recommendations for the Northern Reach

The following is an overview of the recommendations for this reach. Refer to the plans and the detailed recommendations in the front of this report for more information.

The following improvements are recommended:

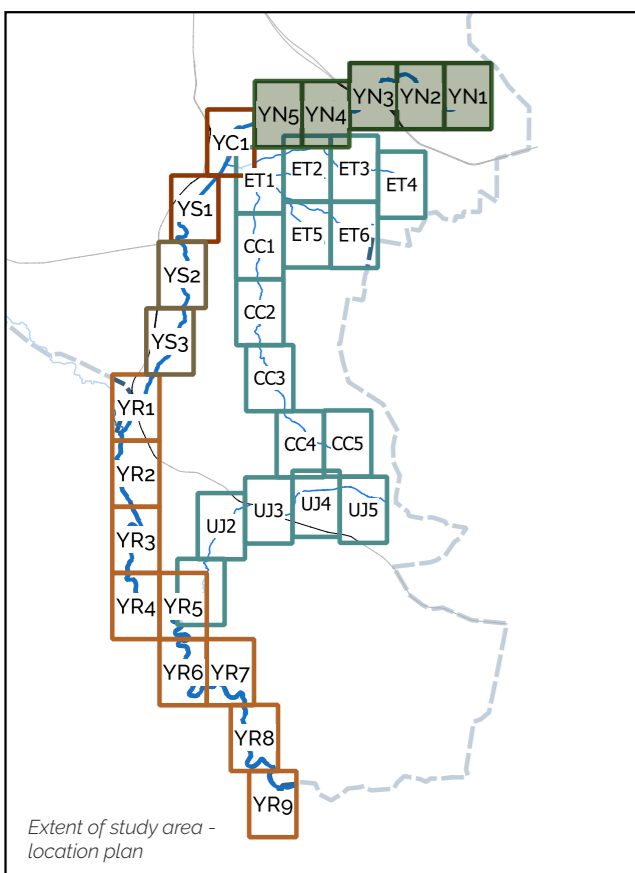
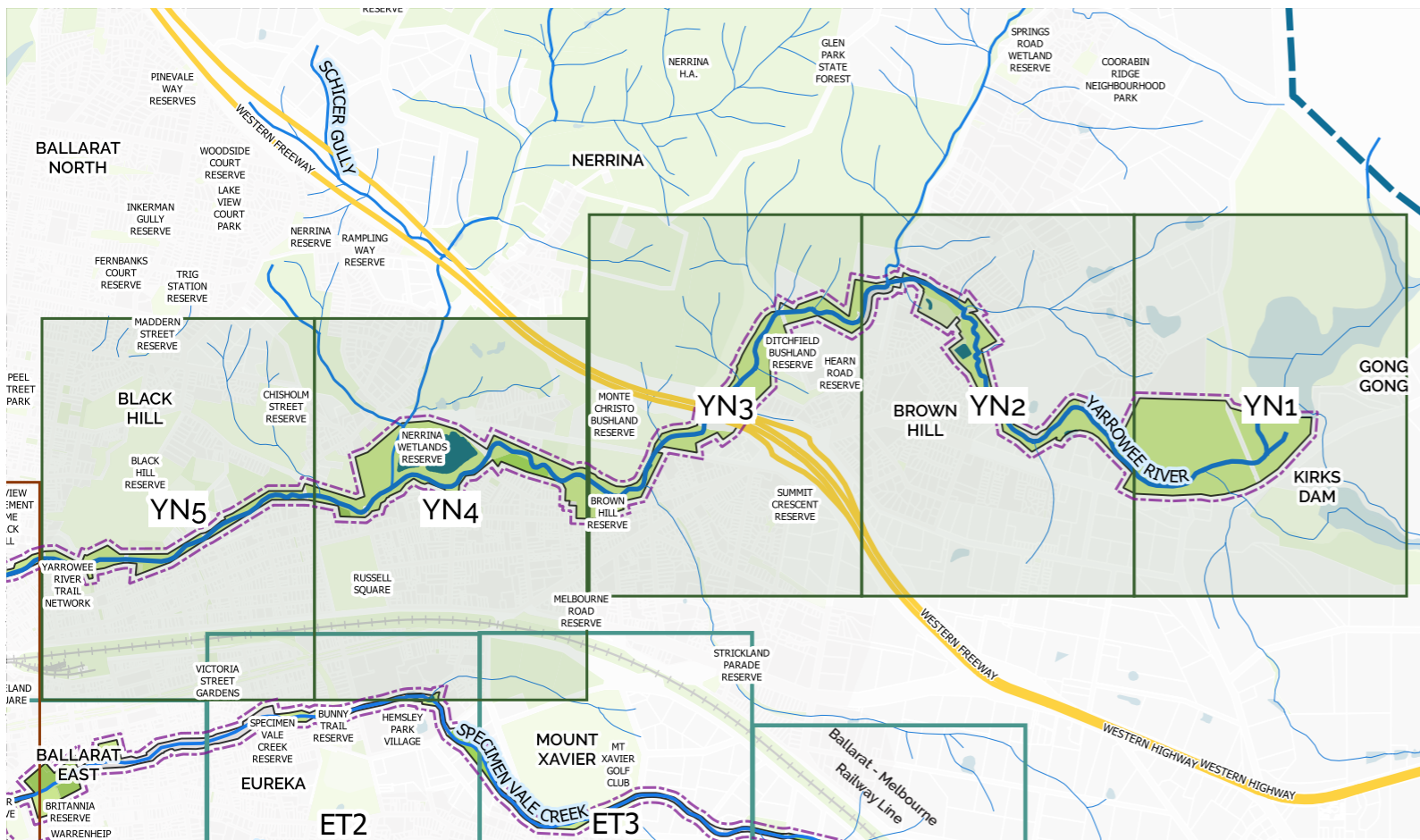
- Upgrade the Yarrowee River trailhead at Gong Gong Reservoir (in association with CHW) and introduce new trail head at Nerrina Wetlands
- Wayfinding signage
- Provide loop paths and wider paths in high use / urban areas and providing linking path connections to destinations and other trail networks
- Provide Active Transport Links including car parking and signage
- Improve links and interface to other reserves by removal of existing fences
- Indigenous revegetation and natural regeneration including canopy trees along trail and reduce extent of rass mowing
- Planning policy / controls for new developments adjoining the river to enhance the river corridor environment and values
- Protect and enhance Ditchfield Bushland Reserve
- Upgrading existing reserve on Morres Street including formalising carparking for mountain bike trails

Tell us your vision for the Yarrowee River corridor

*A natural community asset free of woody weeds and revegetated and maintained for both the community and nature to thrive. A healthy river with environmental flows from the Gong Gong all the way through Ballarat. A natural treasure for Ballarat*

MySay Survey Dec. 2019

# Northern Reach Scope and Reference

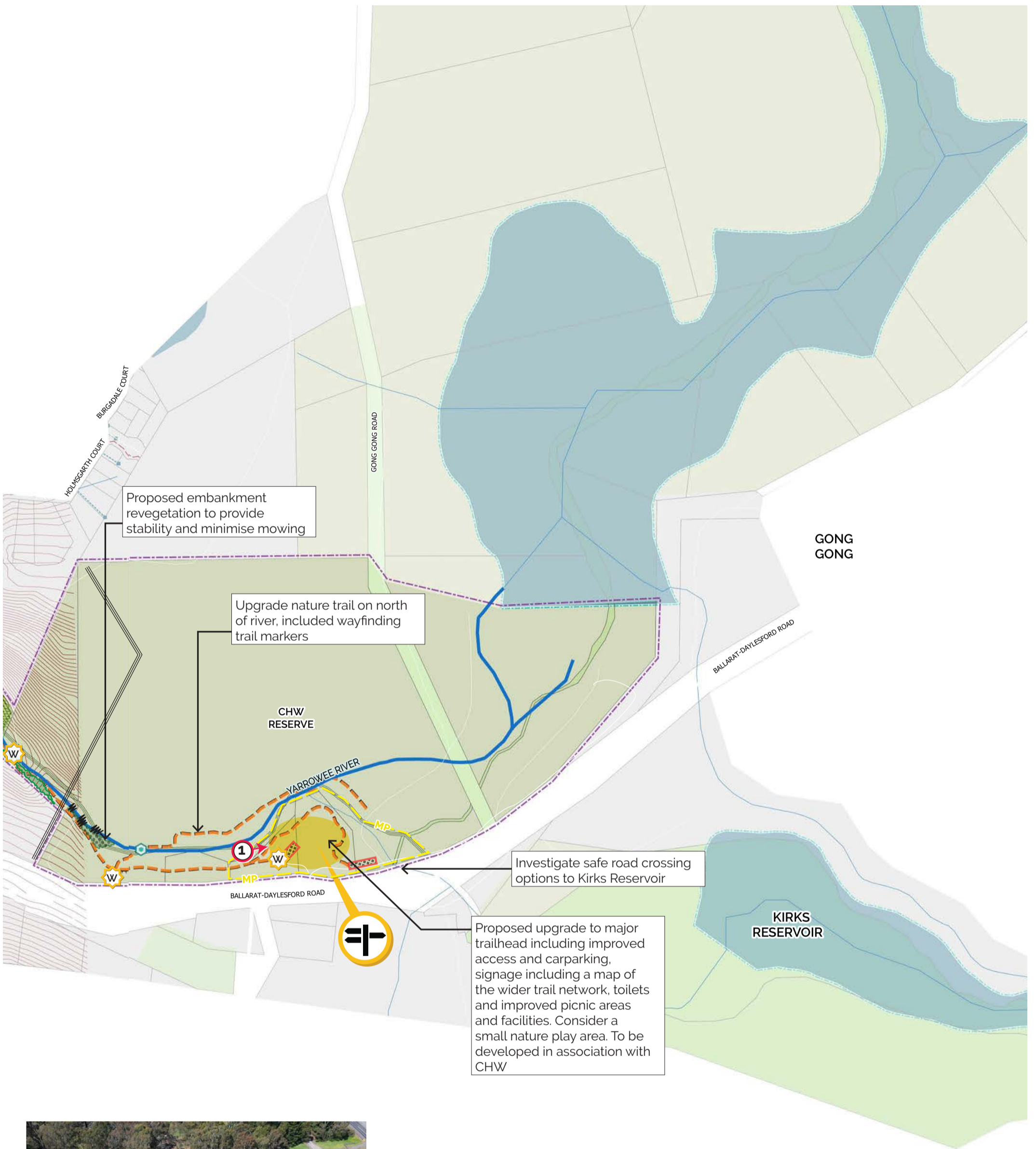


## Legend

- City of Ballarat boundary
- Extent of study
- Waterbody
- Yarrowee River
- Major tributary
- Minor tributary
- Drainage channel
- Yarrowee River - underground
- Channelised waterway
- Title boundary
- Future title boundary
- Contours (1m interval)
- Public Open Space
- Freeway
- Railway line
- Major on-road cycle path
- Footpath
- Major trail - hardstand surface
- Major trail - gravel surface
- Minor trail
- Bridge
- Drainage channel
- Drainage pipe
- Drainage pit
- Q100 flood level (where mapped)
- Playground
- Toilet
- Litter Bin
- Picnic tables
- Public furniture
- Public lighting
- Sign
- PTV Bus Stop
- PTV Regional Bus Route
- Community facility
- Education facility
- Recreation facility
- Aquatic facility

## Masterplan Legend

- Newly planted revegetation
- Existing rock shelf
- Existing carpark
- Existing overhead transmission powerlines
- Proposed pedestrian / cyclist trail
- Proposed maintenance access track / future trail
- Improve pedestrian / cyclist link
- Proposed pedestrian / maintenance bridge
- Proposed stepping stone pedestrian river crossing
- Remove fence
- Proposed carpark
- Proposed revegetation - trees and understorey
- Proposed screen planting
- Proposed embankment revegetation
- Proposed understorey revegetation
- Proposed canopy trees
- Proposed WSUD swale planting
- Priority weed management
- Priority erosion control
- Priority wayfinding signage upgrade
- Proposed interpretative signage / feature
- Opportunity for water interaction
- Proposed trailhead
- Proposed pocket park
- Proposed picnic area
- Possible Active Transport Link carpark
- Area requires further design / masterplanning



1  
Trailhead area

# Yarrowee River North Masterplan

Scale 1:5000 at A3



Formalise existing carpark. Improve amenity by additional internal landscape works including bollards and indigenous shade tree planting to limit opportunity for hoon activity



1 Springs Road carpark

Remove fence to connect public open space to river corridor reserve land. Improve access to trail. Retain fence adjacent to playground

Ensure future development on northern side of river establishes clear links to trail network with generous open space corridor adjoining the river

Proposed maintenance track / future trail along north bank of river

Proposed understorey revegetation in established bushland

Proposed revegetation alongside trail to minimise mowing requirements. Consider extending the Californian Redwood plantation as a contrasting landscape feature along the trail

Proposed tree planting surrounding wetland, provide additional riparian vegetation. Improve link between surrounding track and Yarrowee River Trail

**BROWN HILL**

Introduce shade trees along existing trail and establish clumps of indigenous revegetation to blend existing river corridor canopy into open space parkland. Clumps of trees and shrubs will reduce mowing requirements

Rickeys Quarry flora reserve to be reclassified to a bushland reserve

Proposed small scale picnic area in clearing

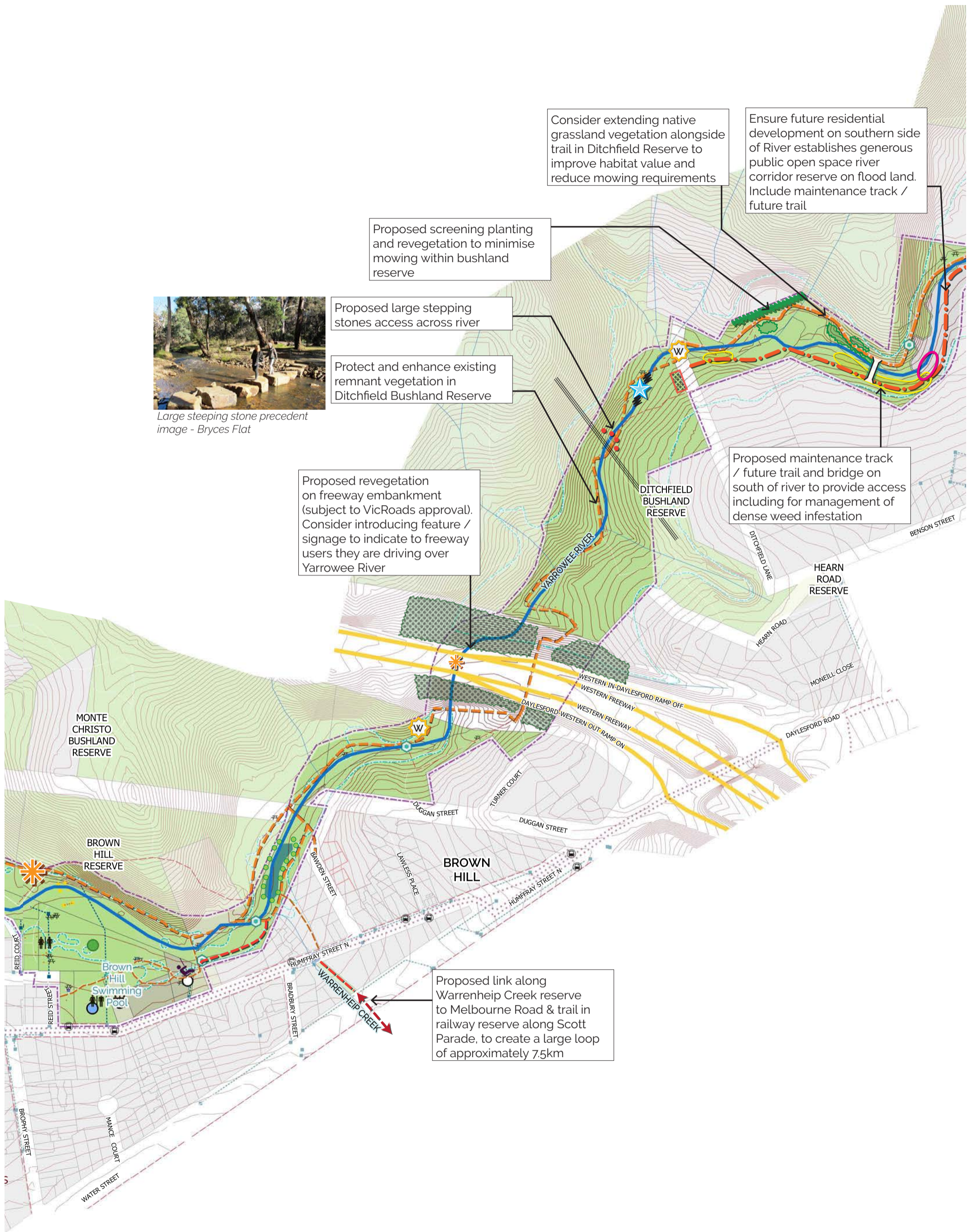
Improve link along drainage reserve. Include signage and shade trees along existing path. Consider aquatic / riparian revegetation of swale drain



**Yarrowee River North**  
Masterplan

Scale 1:5000 at A3





Large stepping stone precedent image - Bryces Flat

# Yarrowee River North Masterplan

Scale 1:5000 at A3







Yarrowee River Central Reach



Yarrowee River channel at Peel Street North, looking to the south west over the Eastern Oval and Ballarat CBD



# Yarrowee River - Central Reach

## Landscape character and general conditions

The central reach is defined as the channelised / underground section of the Yarrowee River between Nicholson Street, Black Hill / Ballarat East and south of Hill Street, Redan / Mt Pleasant.

The river flows through central Ballarat, forming the boundary of adjoining suburbs of Golden Point and Mt Pleasant. The bluestone channel skirts around the Eastern Oval, goes underground on the north side of the railway, under Bridge Mall and the central business area, and resurfaces on the south side of Eastwood Street. The Canadian Creek joins the Yarrowee River at Steinfield Street. The channel continues past the White Flat Oval and Sunnyside Mill before spilling into a more natural earthen channel. The river corridor is contained within a steep valley in the vicinity of Hill Street, and relatively gentle grades elsewhere in the central reach. The channelised section of the river varies in width from 10m to 15m. There are some areas of channel that have little reserve around it, resulting in only a 10m wide reserve. Where there are adjoining reserves, the space varies from 40m - 115m wide.

The network of bluestone, brick and concrete channels and associated bridges are a significant aesthetic, heritage and cultural feature of central Ballarat. The channels were constructed from the 1860s to 1930s, as a result of gold mining activities and increased urbanisation. It is likely that the soil under these channels is contaminated. The channels are of limited social and environmental value forming barriers to human and wildlife movement within the city.

From Eastern Oval the Yarrowee River Trail follows Peel Street and Eastwood Street. The channel re-opens south of Eastwood Street. A granitic sand path begins from the White Flat Oval, heading south (terminating at Docwra Street).

The river corridor is highly modified throughout the central reach; however it has mostly an active frontage and adjoins significant public open space. There are opportunities to improve accessibility and provide a green pedestrian / cycle link to and through central Ballarat within the Yarrowee River corridor.

## Assessment of the 1995 Masterplan

Changes since the original landscape masterplan include:

- some areas of revegetation
- modest development of trails, and
- signage and safe pedestrian crossing points.

Many ideas from the original landscape masterplan have not been implemented, including a proposal to create an urban plaza and daylighting the Yarrowee River between Little Bridge Street and Eastwood Street. The Yarrowee River Urban Park is a key project in the Bakery Hill Urban Renewal Plan, with recommendations to redevelop existing car parking into 7,000m<sup>2</sup> of parkland and expose sections of the Yarrowee River. The park may include space for a playground, community events and stage / viewing area.



Bluestone channel near White Flat Oval



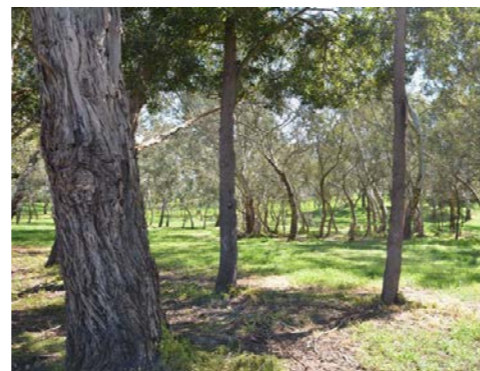
Northern end of channelised section of Yarrowee River. Concrete channel.



Bluestone channel through Eastern Oval. Oval facilities are fragmented by the channel.



View to Sunnyside Mill



Revegetation planting near Hill Street



Yarrowee River channel at Anderson Street with car parking on both sides



End of the channelised section of the Yarrowee River

## Overview of recommendations for the Central Reach

The following is an overview of the recommendations for this reach. Refer to the plans and the detailed recommendations in the front of this report for more information.

The following improvements are recommended:

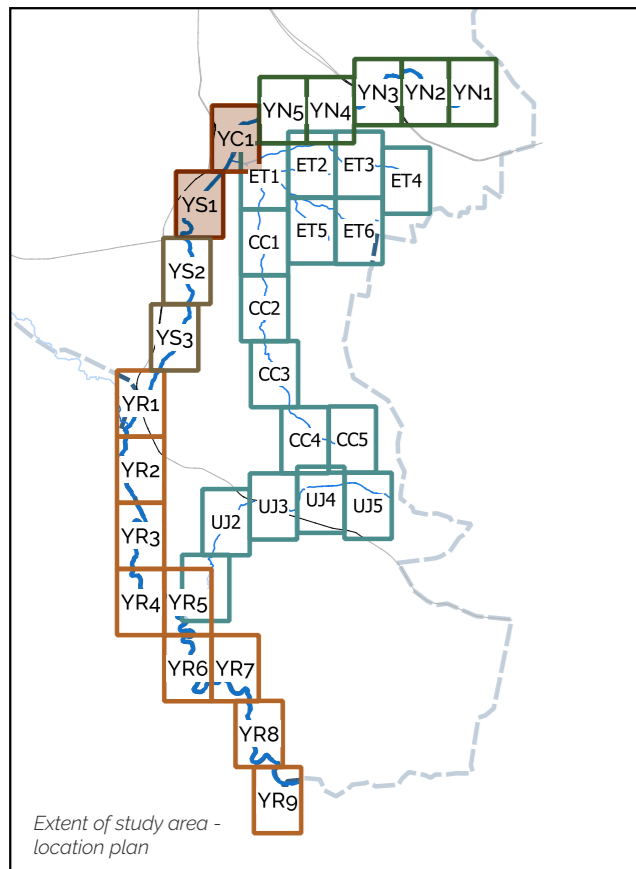
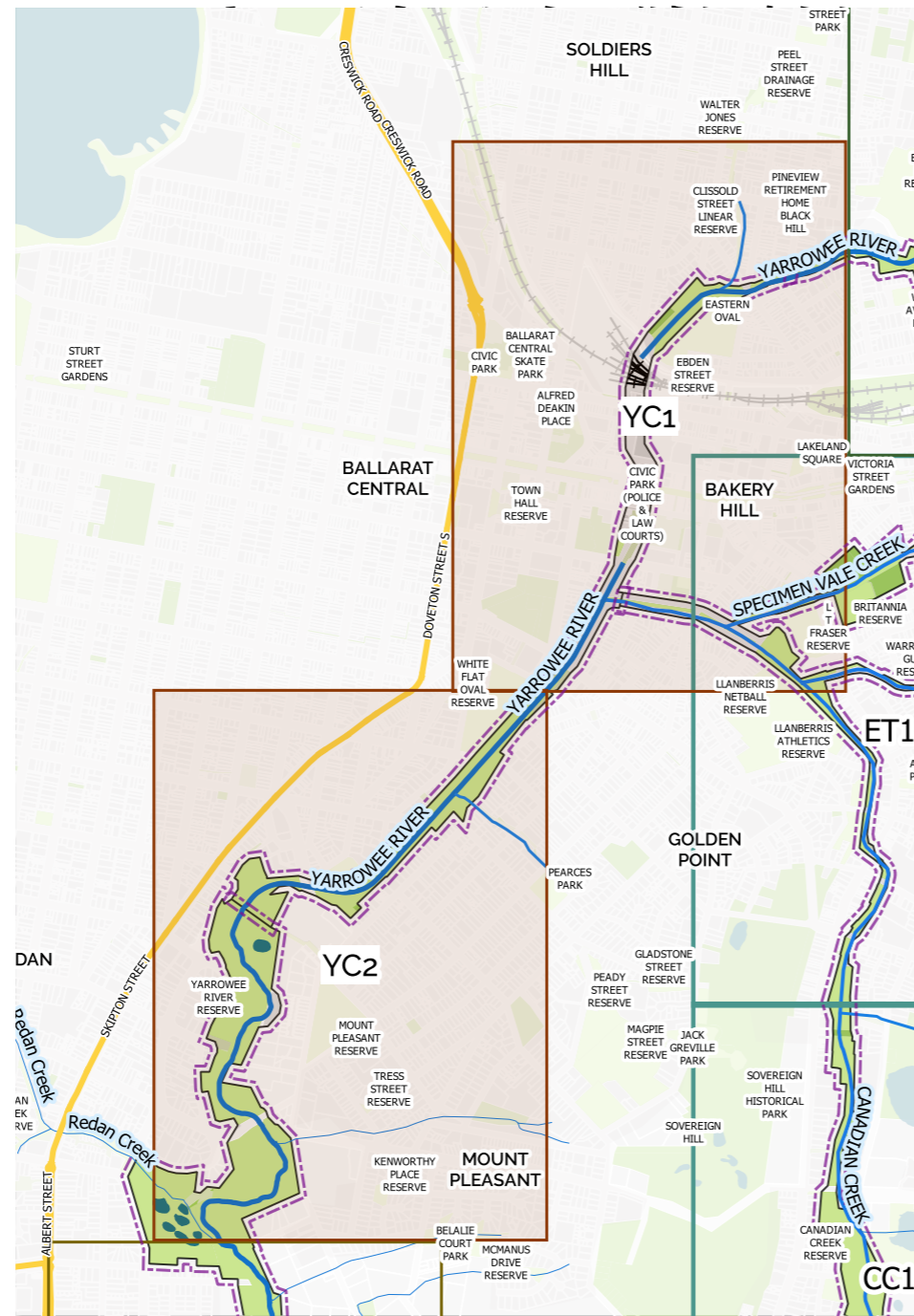
- Develop green pedestrian / cycle links to improve the pedestrian and cyclist connection between the north and south stretches of the Yarrowee River Trail
- Provide loop paths in high use / urban areas
- Wetlands and WSUD to improve water quality
- Development of pocket parks in key areas
- Revegetation in selected areas
- Planting of exotic and native trees in selected areas
- Development of the Eastern Oval precinct to improve pedestrian / cycle links
- Wayfinding signage
- Yarrowee Urban Parkland upgrade as part of the Bakery Hill Urban Renewal Plan including the development of a CBD trail head

Tell us your vision for the Yarrowee River corridor

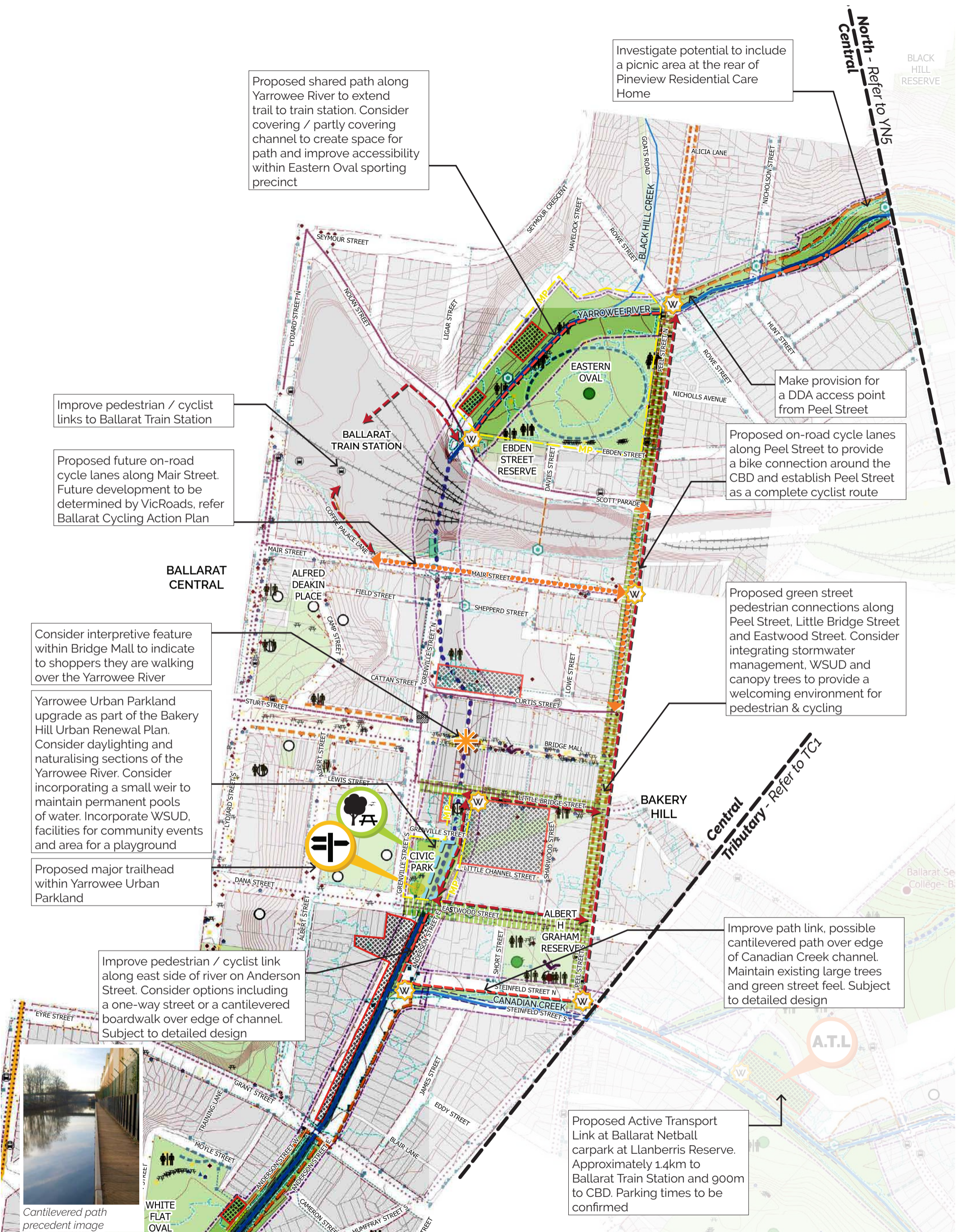
Access ability for people with a disability. Wonderful inner-city place to walk pets and connect with nature. Like bridges and ability to walk long or short, compared to min. 6kms at the lake.

MySay Survey Nov. 2019

# Central Reach Scope and Reference



- ### Legend
- City of Ballarat boundary
  - Extent of study
  - Waterbody
  - Yarrowee River
  - Major tributary
  - Minor tributary
  - Drainage channel
  - Yarrowee River - underground
  - Channelised waterway
  - Title boundary
  - Future title boundary
  - Contours (1m interval)
  - Public Open Space
  - Freeway
  - Railway line
  - Major on-road cycle path
  - Footpath
  - Major trail - hardstand surface
  - Major trail - gravel surface
  - Minor trail
  - Bridge
  - Drainage channel
  - Drainage pipe
  - Drainage pit
  - Q100 flood level (where mapped)
  - Playground
  - Toilet
  - Litter Bin
  - Picnic tables
  - Public furniture
  - Public lighting
  - Sign
  - PTV Bus Stop
  - PTV Regional Bus Route
  - Community facility
  - Education facility
  - Recreation facility
  - Aquatic facility
- ### Masterplan Legend
- Existing carpark
  - Existing gross pollutant trap
  - Proposed on-road cycle lane connection
  - Improve existing on-road cycle connection
  - Proposed pedestrian / cyclist trail
  - Improve pedestrian / cyclist link
  - Proposed carpark
  - Proposed instream litter trap
  - Proposed screen planting
  - Proposed path / channel edge low planting
  - Proposed 'Green Street' incl. canopy trees and WSUD
  - Possible naturalisation of waterway
  - Priority wayfinding signage upgrade
  - Proposed interpretative signage / feature
  - Proposed trailhead
  - Proposed pocket park
  - Possible Active Transport Link carpark
  - Area requires further design / masterplanning



Proposed shared path along Yarrowee River to extend trail to train station. Consider covering / partly covering channel to create space for path and improve accessibility within Eastern Oval sporting precinct

Investigate potential to include a picnic area at the rear of Pineview Residential Care Home

Improve pedestrian / cyclist links to Ballarat Train Station

Proposed future on-road cycle lanes along Mair Street. Future development to be determined by VicRoads, refer Ballarat Cycling Action Plan

Make provision for a DDA access point from Peel Street

Proposed on-road cycle lanes along Peel Street to provide a bike connection around the CBD and establish Peel Street as a complete cyclist route

**BALLARAT CENTRAL**

Consider interpretive feature within Bridge Mall to indicate to shoppers they are walking over the Yarrowee River

Yarrowee Urban Parkland upgrade as part of the Bakery Hill Urban Renewal Plan. Consider daylighting and naturalising sections of the Yarrowee River. Consider incorporating a small weir to maintain permanent pools of water. Incorporate WSUD, facilities for community events and area for a playground

Proposed major trailhead within Yarrowee Urban Parkland

Proposed green street pedestrian connections along Peel Street, Little Bridge Street and Eastwood Street. Consider integrating stormwater management, WSUD and canopy trees to provide a welcoming environment for pedestrian & cycling

**Central Tributary - Refer to TC1**

**BAKERY HILL**

Improve pedestrian / cyclist link along east side of river on Anderson Street. Consider options including a one-way street or a cantilevered boardwalk over edge of channel. Subject to detailed design

Improve path link, possible cantilevered path over edge of Canadian Creek channel. Maintain existing large trees and green street feel. Subject to detailed design

Proposed Active Transport Link at Ballarat Netball carpark at Llanberris Reserve. Approximately 1.4km to Ballarat Train Station and 900m to CBD. Parking times to be confirmed

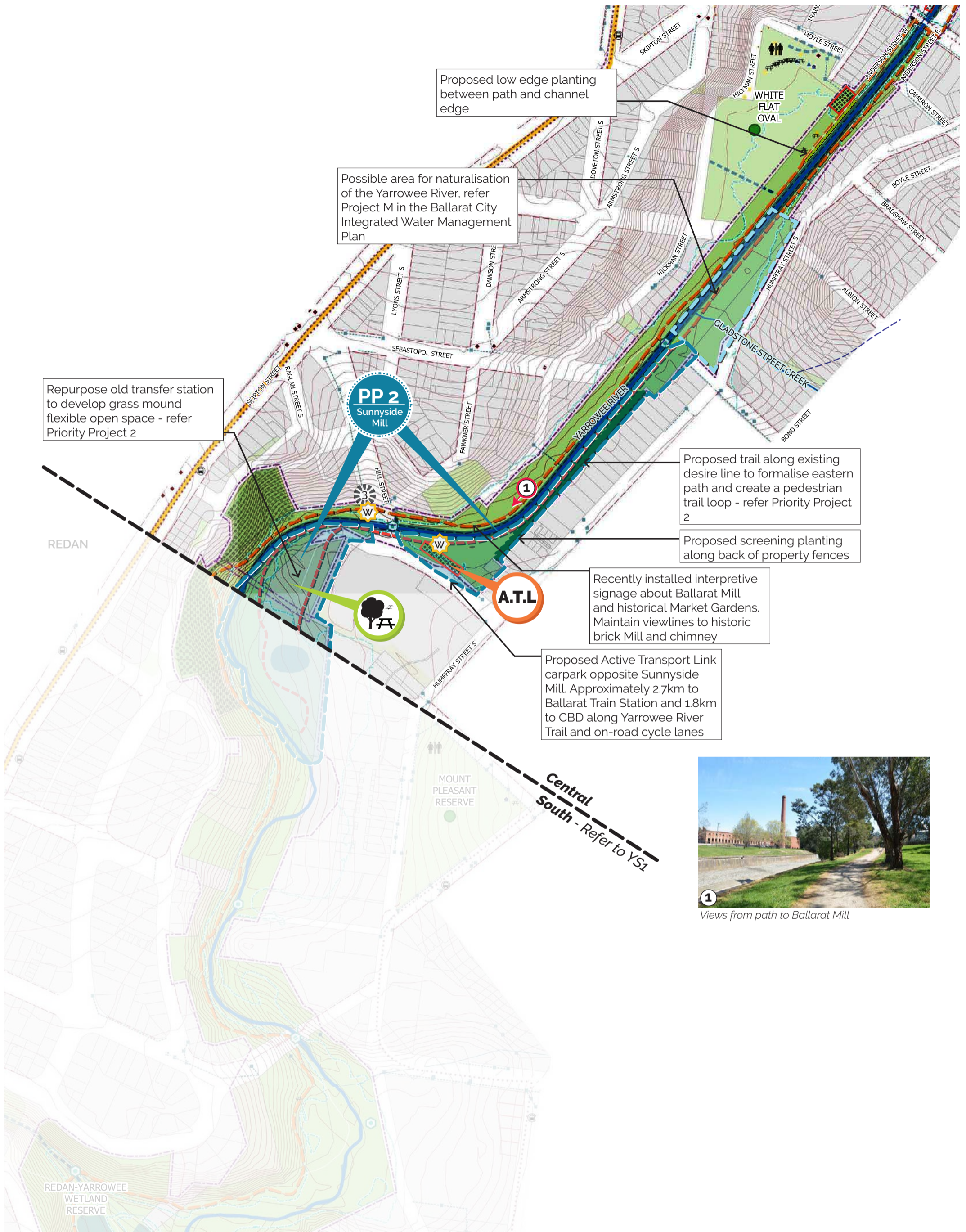
Cantilevered path precedent image

WHITE FLAT OVAL

# Yarrowee River Central Masterplan

Scale 1:5000 at A3



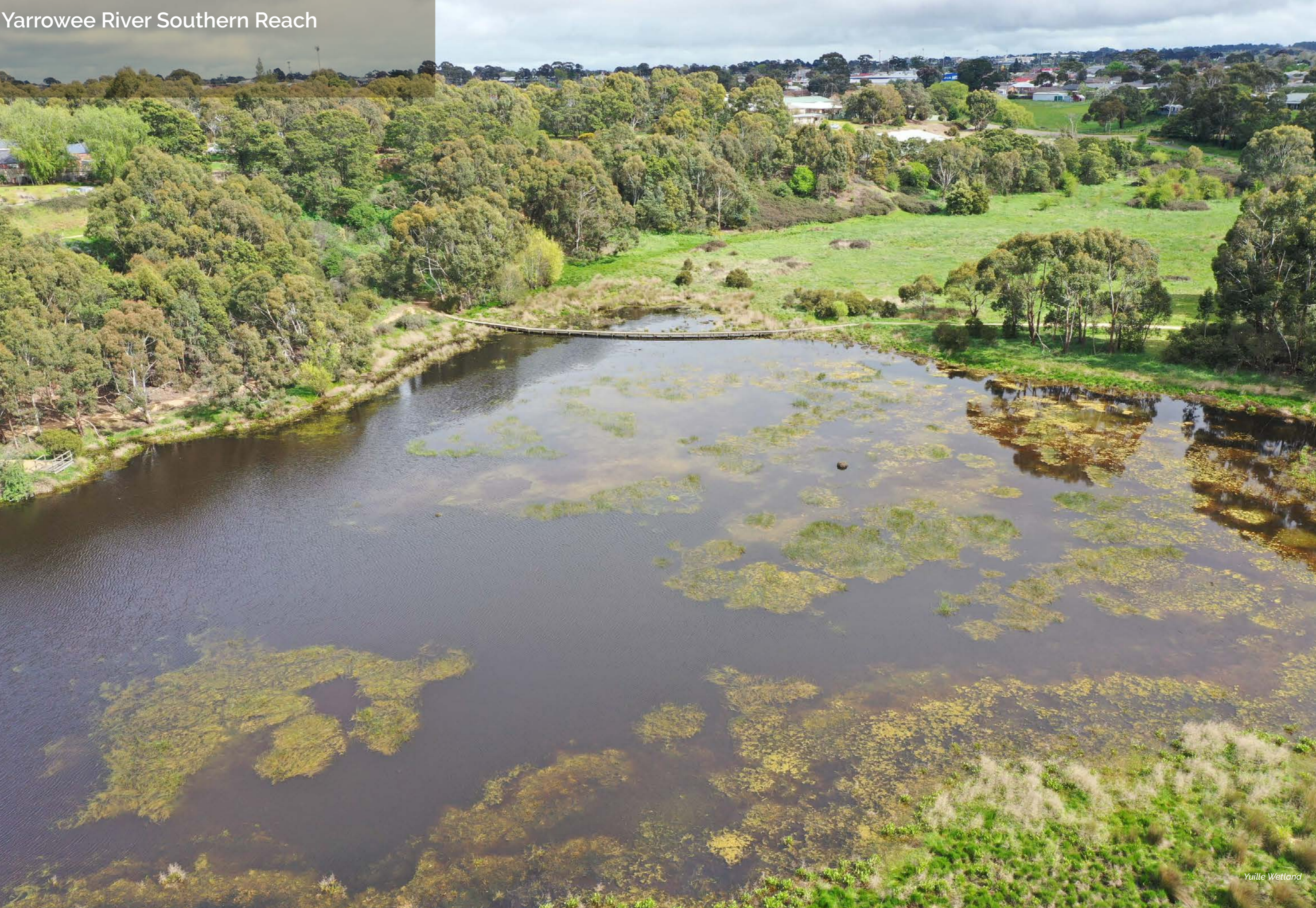


# Yarrowee River Central Masterplan

Scale 1:5000 at A3



Yarrowee River Southern Reach



# Yarrowee River - Southern Reach

## Landscape character & general conditions

The southern reach of the Yarrowee River starts at the end of the channelised section near Hill Street and extends to Docwra Street bridge. The river flows south and forms the boundary of suburbs including Redan, Mount Pleasant, Sebastopol, Mount Clear and Magpie.

Adjoining land use is mostly residential on the western side, with some industrial areas. Ballarat Gold Mine and Central Highlands Water Ballarat South Wastewater Treatment Plant adjoin the east side of the river corridor. Marty Busch Reserve is a significant sports facility adjoining the river corridor on the west side.

The Redan Creek joins the Yarrowee River at Rubicon Street. The outflow from Central Highlands Water Ballarat South Treatment Plant adds a significant volume of water to the river.

The river corridor is a deep valley with relatively flat land to the west and undulating to the east. A well used trail has been constructed along the west bank (mostly granitic sand) and the river has a generous reserve either side (total width varies between 50 - 150m). Tree plantings between Hill Street and Prest Street in the 1980's are the earliest revegetation works in the Yarrowee River corridor and are now well established. The area between Whitehorse Road and Docwra Street is somewhat degraded; issues include impacts from mining waste from 1850s gold rush (sludge), erosion of banks, steep slopes and weeds. There is soil contamination (lead) on the slopes below the Marty Busch Reserve, this is associated with the former Sebastopol Gun Club.

EVC's in the southern reach are mostly Swampy Riparian Woodland, with small intrusions of Heathy Dry Forest.

## Assessment of the 1995 Masterplan

Changes since the original landscape masterplan include:

- extensive revegetation (mostly canopy trees),
- development of the Redan and Yuille wetlands to improve stormwater management / treatment and
- construction of trails for walking, cycling and maintenance access.

The area between Hill Street and Prest Street was the first part of the river planted (1982), and is gaining an attractive mature appearance. Downstream, the LINC'S plantings are maturing, creating an attractive area for varied recreational opportunities. Central Highlands Water has contributed to some of the plantings in the vicinity of the Ballarat South Wastewater Treatment Plant.

These changes have significantly improved the environmental and recreation values of the river. The Yuille wetlands demonstrate significant environmental benefits and habitat value, and are a popular spot for bird watching.



End of the lined Yarrowee River channel



Potential lookout site on a river bend near Prest Street



Redan Wetlands



Tannery Lane pedestrian bridge



Erosion of CHW treatment plant pond bank



Edge of lava flow



Areas of contaminated soil have struggled to grow vegetation due to sludge depths



Informal river crossing

## Overview of recommendations for the Southern Reach

The following is an overview of the recommendations for this reach. Refer to the plans and the detailed recommendations in the front of this report for more information.

The following improvements are recommended:

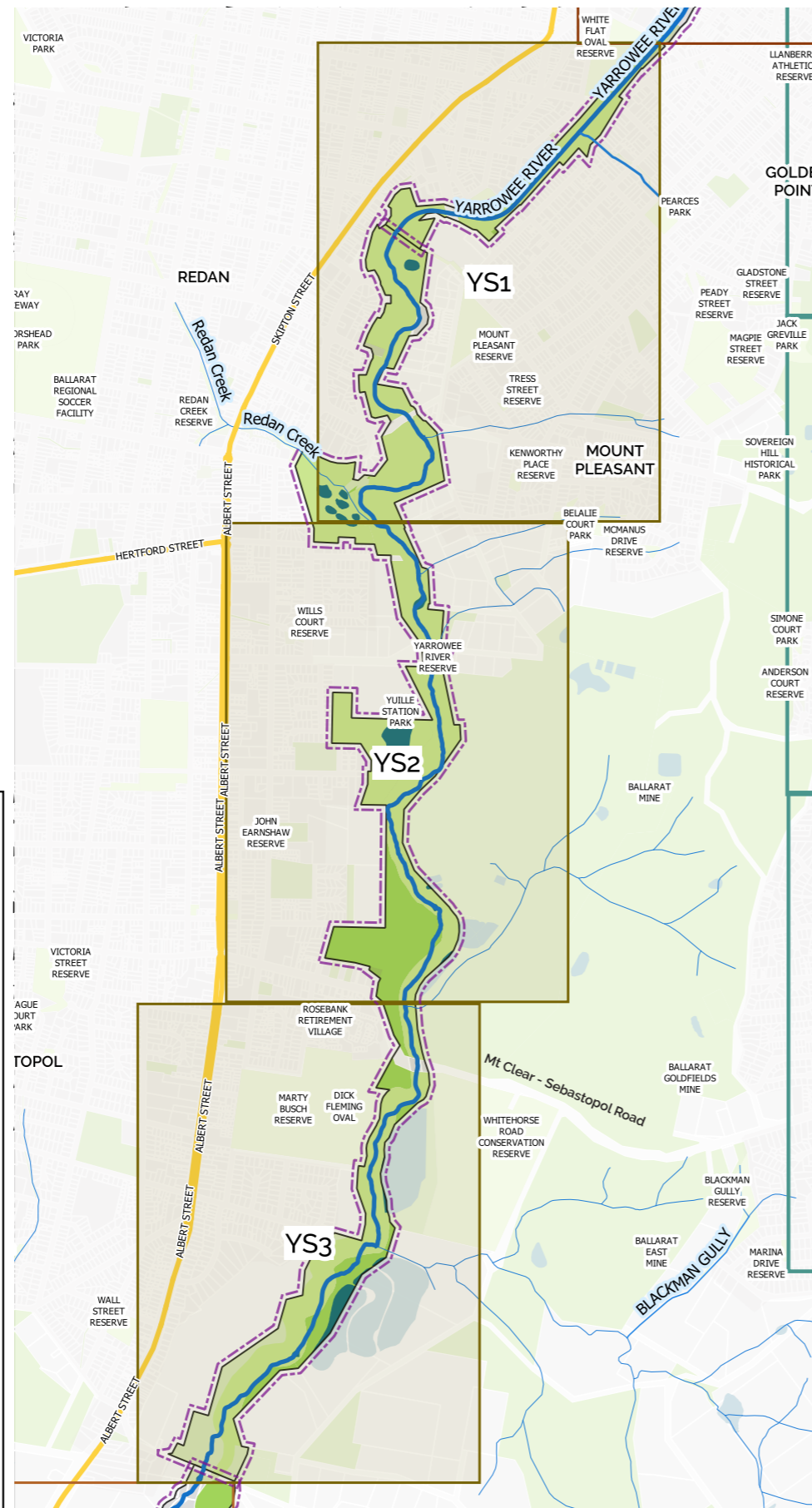
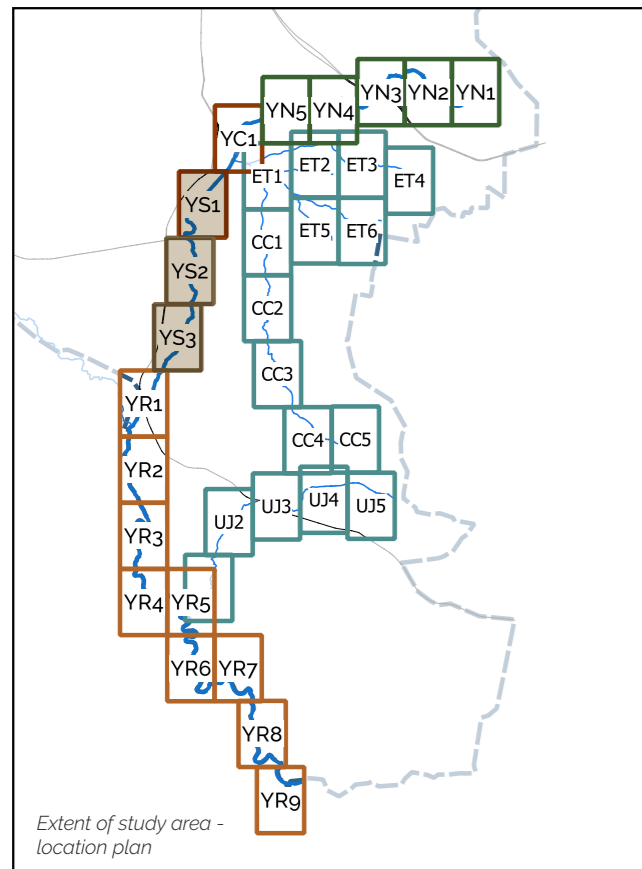
- Development of wetlands and WSUD features to improve water quality and habitat values
- Erosion control along CHW treatment pond walls
- Improve links to other reserves
- Provide loop paths in high use / urban areas
- Weed control, indigenous revegetation, canopy trees and screening of undesirable views
- Create loop paths at Yuille Wetlands and increase indigenous tree canopy cover
- Wayfinding signage
- Gross pollutant trap and / or litter trap within Sunnyside Mill Parklands
- Priority Project 1 - Dowcra Street Trail Head
- Prest Street Lookout as part of Priority Project 1
- Priority Project 2 - Sunnyside Mill Parklands
- Priority Project 3 - Redan Wetlands Revitalisation

Tell us your vision for the Yarrowee River corridor

*Need to improve the health / quality of water particularly around wetlands at the South, heaps of rubbish & litter all around the South area (Redan / Sebastopol). Not good for river health downstream for Garibaldi & Napoleons*

MySay Survey Nov. 2019

# Southern Reach Scope and Reference

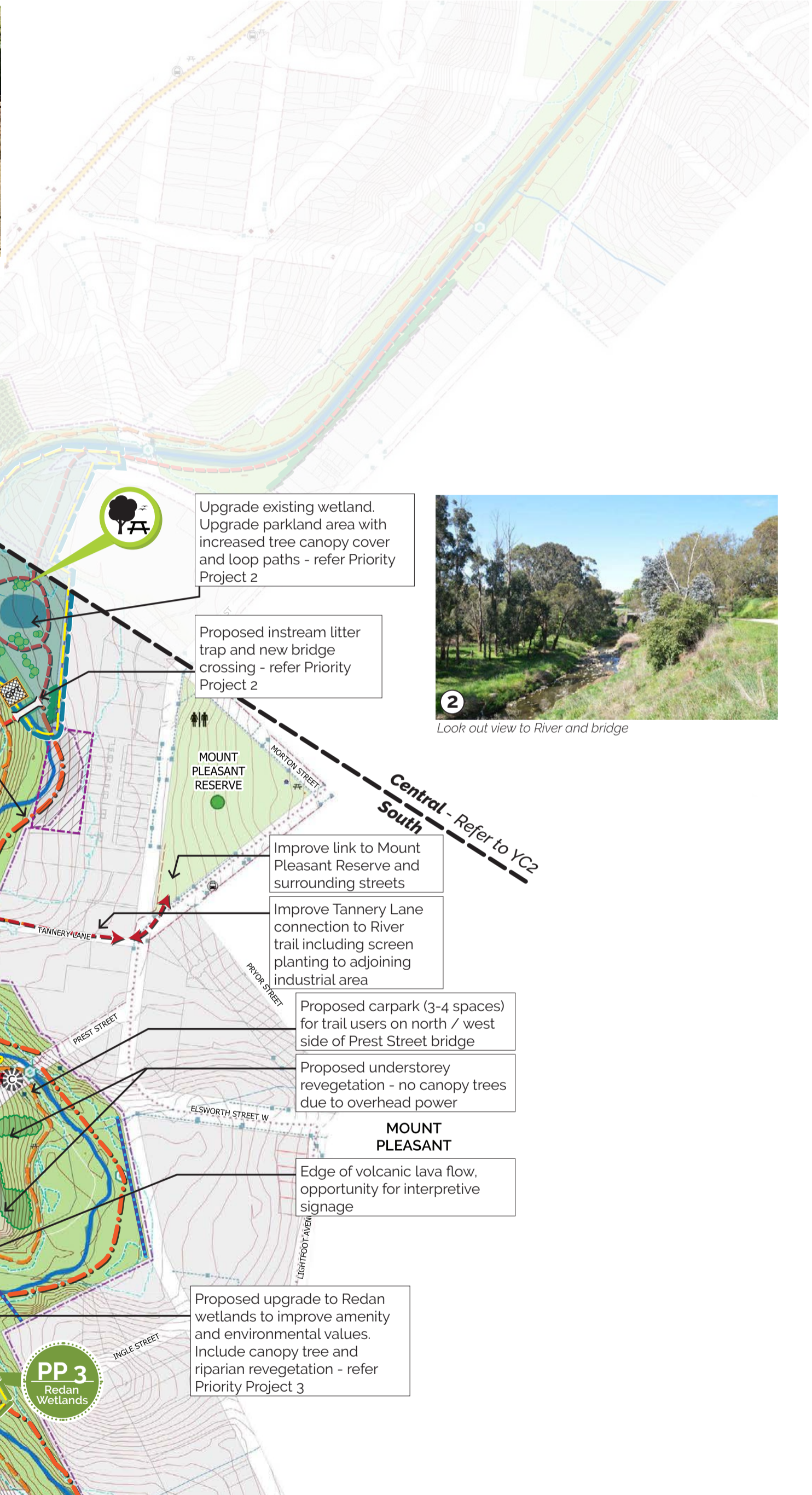


- ### Legend
- City of Ballarat boundary
  - Extent of study
  - Waterbody
  - Yarrowee River
  - Major tributary
  - Minor tributary
  - Drainage channel
  - Yarrowee River - underground
  - Channelised waterway
  - Title boundary
  - Future title boundary
  - Contours (1m interval)
  - Public Open Space
  - Freeway
  - Railway line
  - Major on-road cycle path
  - Footpath
  - Major trail - hardstand surface
  - Major trail - gravel surface
  - Minor trail
  - Bridge
  - Drainage channel
  - Drainage pipe
  - Drainage pit
  - Q100 flood level (where mapped)
  - Playground
  - Toilet
  - Litter Bin
  - Picnic tables
  - Public furniture
  - Public lighting
  - Sign
  - PTV Bus Stop
  - PTV Regional Bus Route
  - Community facility
  - Education facility
  - Recreation facility
  - Aquatic facility

- ### Masterplan Legend
- Existing CHW treated water outlet
  - Existing rock shelf
  - Contaminated soil
  - Existing carpark
  - Existing above ground pipeline
  - Existing gross pollutant trap
  - Proposed pedestrian / cyclist trail
  - Proposed maintenance access track / future trail
  - Improve pedestrian / cyclist link
  - Proposed pedestrian / maintenance bridge
  - Proposed stepping stone pedestrian river crossing
  - (Proposed) fence to accurate boundary
  - Proposed carpark
  - Proposed instream litter trap
  - Proposed revegetation - trees and understorey
  - Proposed screen planting
  - Proposed embankment revegetation
  - Proposed canopy trees
  - Proposed WSUD swale planting
  - Priority weed management
  - Priority erosion control
  - Priority sludge management
  - Proposed wetland opportunity
  - Priority wayfinding signage upgrade
  - Proposed interpretative signage / feature
  - Proposed lookout
  - Opportunity for water interaction
  - Proposed trailhead
  - Proposed pocket park
  - Proposed picnic area
  - Possible kayak launch / dismount point
  - Undevelopable private land opportunity
  - Area requires further design / masterplanning



1 End of channel and Central Yarrowee Reach



2 Look out view to River and bridge

Provide continuous link from Hill Street to Prest Street on east side of river. Consider acquiring private land where river has encroached. Link maintenance track / future trail to Tannery Lane bridge and continue south into reserve land. Some narrow areas between boundaries and river may require boardwalk treatment or similar

Opportunity for lookout on mine foundation at high point along path. Include interpretative signage to describe the gold mining history and effects on the Yarrowee River

Improve path links along northern side of Prest Street to link to existing footpath network

Upgrade existing wetland. Upgrade parkland area with increased tree canopy cover and loop paths - refer Priority Project 2

Proposed instream litter trap and new bridge crossing - refer Priority Project 2

Improve link to Mount Pleasant Reserve and surrounding streets

Improve Tannery Lane connection to River trail including screen planting to adjoining industrial area

Proposed carpark (3-4 spaces) for trail users on north / west side of Prest Street bridge

Proposed understorey revegetation - no canopy trees due to overhead power

Edge of volcanic lava flow, opportunity for interpretive signage

Proposed upgrade to Redan wetlands to improve amenity and environmental values. Include canopy tree and riparian revegetation - refer Priority Project 3

**PP 2**  
Sunnyside Mill

**PP 3**  
Redan Wetlands

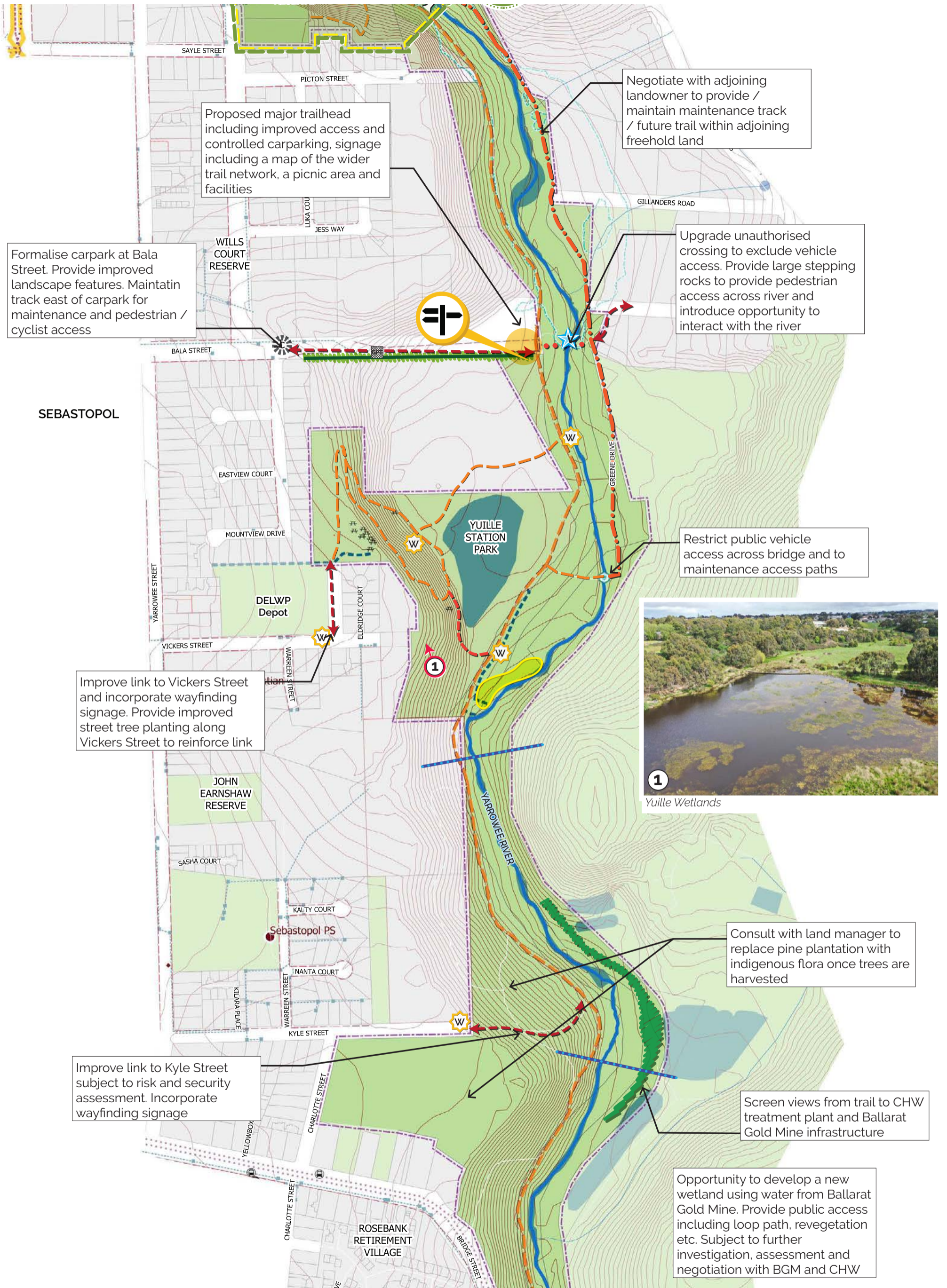
Central - Refer to YC2  
South

Yarrowee River South Masterplan

Scale 1:5000 at A3







# Yarrowee River South Masterplan

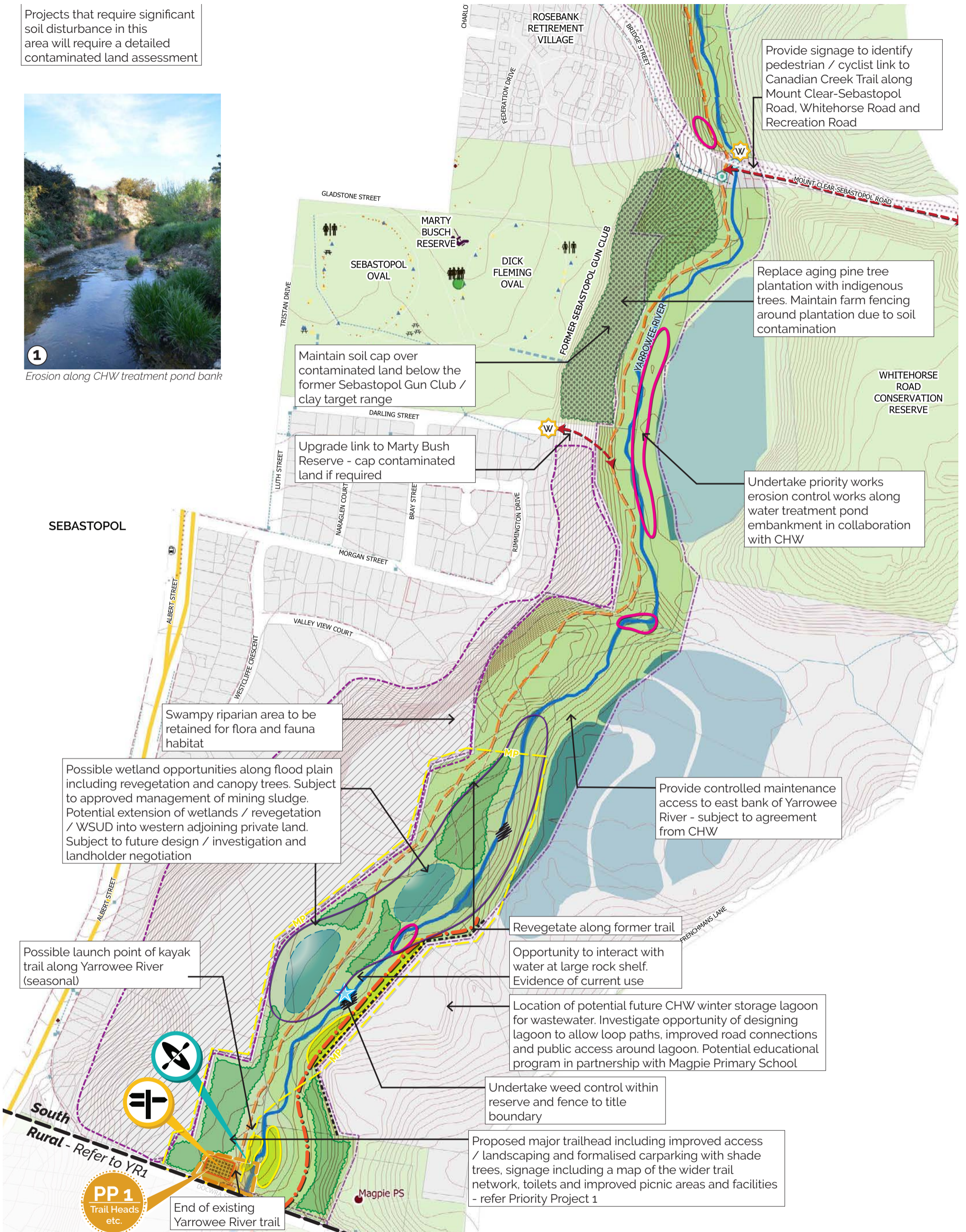
Scale 1:5000 at A3



Projects that require significant soil disturbance in this area will require a detailed contaminated land assessment



1 Erosion along CHW treatment pond bank



Provide signage to identify pedestrian / cyclist link to Canadian Creek Trail along Mount Clear-Sebastopol Road, Whitehorse Road and Recreation Road

Replace aging pine tree plantation with indigenous trees. Maintain farm fencing around plantation due to soil contamination

Maintain soil cap over contaminated land below the former Sebastopol Gun Club / clay target range

Upgrade link to Marty Bush Reserve - cap contaminated land if required

Undertake priority works erosion control works along water treatment pond embankment in collaboration with CHW

Swampy riparian area to be retained for flora and fauna habitat

Possible wetland opportunities along flood plain including revegetation and canopy trees. Subject to approved management of mining sludge. Potential extension of wetlands / revegetation / WSUD into western adjoining private land. Subject to future design / investigation and landholder negotiation

Provide controlled maintenance access to east bank of Yarrowee River - subject to agreement from CHW

Possible launch point of kayak trail along Yarrowee River (seasonal)

Revegetate along former trail  
Opportunity to interact with water at large rock shelf. Evidence of current use

Location of potential future CHW winter storage lagoon for wastewater. Investigate opportunity of designing lagoon to allow loop paths, improved road connections and public access around lagoon. Potential educational program in partnership with Magpie Primary School

Undertake weed control within reserve and fence to title boundary

Proposed major trailhead including improved access / landscaping and formalised carparking with shade trees, signage including a map of the wider trail network, toilets and improved picnic areas and facilities - refer Priority Project 1

PP1 Trail Heads etc.

End of existing Yarrowee River trail

# Yarrowee River South Masterplan

Scale 1:5000 at A3



Yarrowee River Rural Reach



Yarrowee River near Napoleons / Scotchmans Lead

# Yarrowee River - Rural Reach

## Landscape character & general conditions

The rural reach of the Yarrowee River is defined as the section downstream from Docwra Street bridge, which flows through localities on the southern rural fringe of Ballarat including Cambrian Hill, Scotchmans Lead, Durham Lead, Napoleons and Garibaldi.

Winter Creek flows from Ballarat's western suburbs and joins the Yarrowee River downstream of Midland Highway bridge. Union Jack Creek which drains the Buninyong area joins the Yarrowee River downstream of Scotchmans Lead Road bridge.

The Yarrowee River forms the boundary of City of Ballarat and Golden Plains Shire along this reach. The study area for this project ends at the Buninyong - Mt Mercer Road bridge. From here the Yarrowee flows into the Leigh River and Barwon River, emptying into Bass Strait at Barwon Heads.

The river bed is generally wider and has a meandering course through the rural landscape. There are several billabongs left behind where the river has changed course over the years. Similar to the southern reach, there are flow on impacts from sludge, erosion of beds / banks and steep slopes.

A strip of crown land runs alongside the river (total width varies between 40 - 300m, average width is 100m). Much of the crown land has Riparian Management, Water Frontage or Grazing Licences; with some sections of unreserved crown land.

The EVC's in the rural reach are Swampy Riparian Woodland upstream of confluence with Dog Trap Creek and Stream Bank Shrubland downstream. The vegetation along the river corridor varies from weed infested areas to newly planted and well established revegetation. Downstream of Glassons Road is generally weed infested with little indigenous vegetation. Gorse and blackberry continue to be a major problem in parts. Some adjacent landholders continue to graze to the water's edge and the most serious erosion issues occur in this section.

Public access to the river is currently limited, and includes bridge crossing points at Midland Highway, Nolans Road, Scotchmans Lead Road, South Durham Bridge Road and Buninyong - Mt Mercer Road. There is a reserve connecting Colac - Ballarat Road and the Yarrowee River corridor at School Lane intersection at Cambrian Hill. Tommys Lane and Glassons Road also in Cambrian Hill provides access to the river; however the existing footbridge at the end of Glassons Road is unsafe and should be replaced.

A trail called Bridge to Bridge Walk starting from South Durham Bridge Road is being developed by the Garibaldi Landcare Group.

## Assessment of the 1995 Masterplan

Local Landcare Groups including Napoleons and Garibaldi have done great work on weed control and revegetation.

There is a very successful community planting downstream from Glasson's Road, where Napoleons Landcare Group has co-ordinated works and contributed numerous volunteer hours. Trees and shrubs provide an attractive environment on the west side of the river.

More recently, Napoleons Landcare Group have been targeting the Union Jack Creek confluence with Yarrowee River.

Garibaldi Landcare Group has established the Bridge to Bridge walk through their maturing plantings, although it does not yet fulfil its aim to walk along the river from South Durham Bridge to Garibaldi Bridge due to overwhelming weed problems in the downstream half.

Areas of revegetation have been successful; however there is opportunity to extend the planting over the full length and width of the crown land reserve.



Severe erosion along the river bank



Landscape of the Bridge to Bridge Walk



Billabong at the end of the Bridge to Bridge Walk



Nolans Road Bridge

## Overview of recommendations for the Rural Reach

The following is an overview of the recommendations for this reach. Refer to the plans and the detailed recommendations in the front of this report for more information.

The following improvements are recommended:

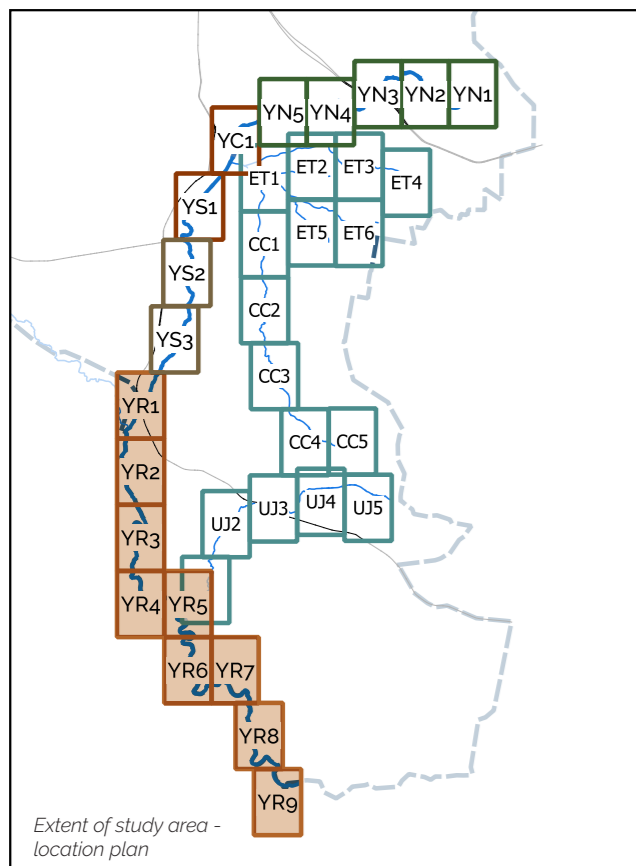
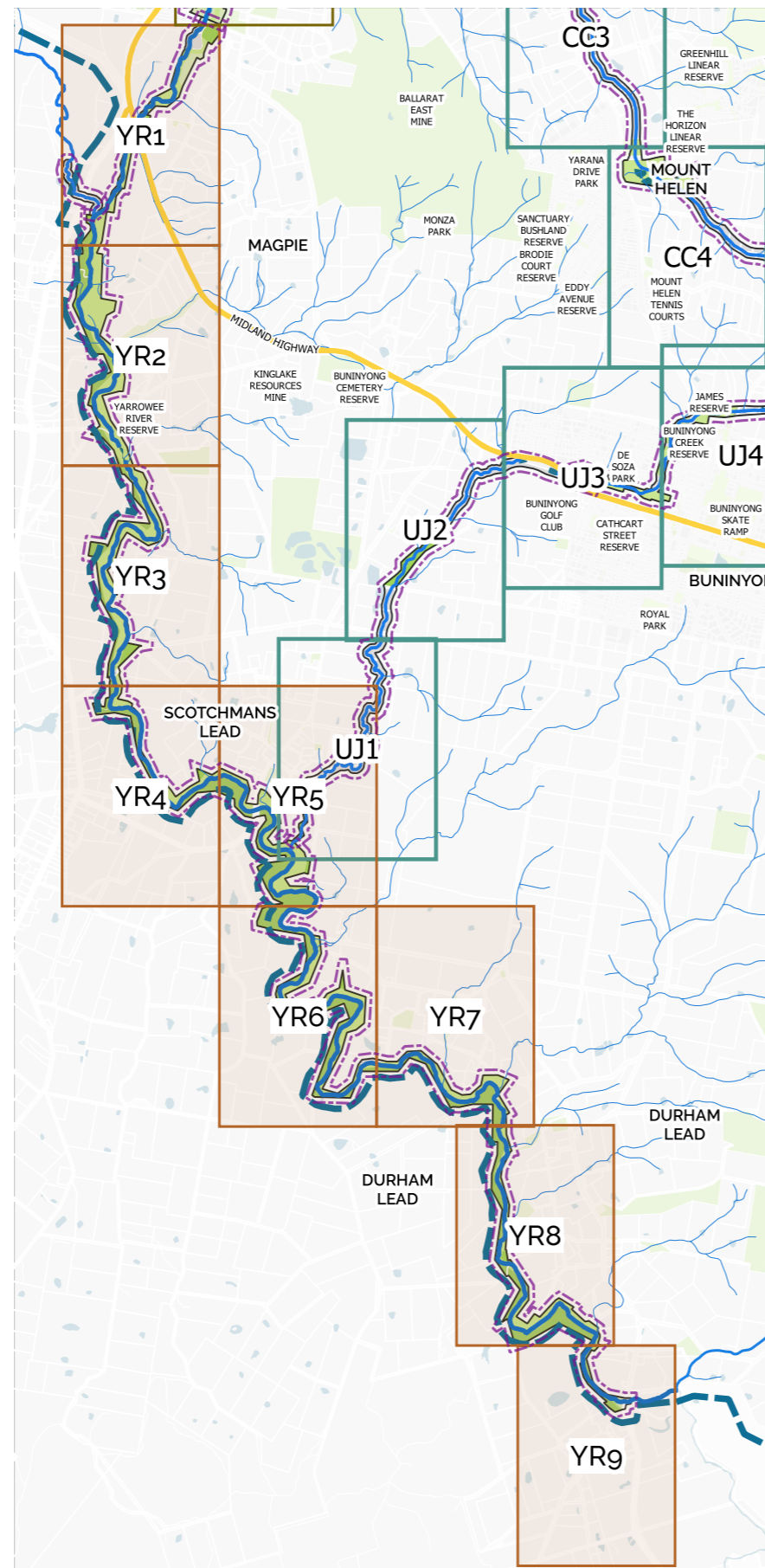
- Stock proof farm fencing to correct title boundaries along the river corridor to exclude stock access
- Weed and pest control and fencing
- Indigenous revegetation in reserve land including steep embankments
- Erosion control and sludge management
- Maintenance of access tracks - future trail extension
- Provide walking / cycling trails and bridges based on demand
- Provide picnic facilities where there are existing features of interest
- Development of future trail head at edge of CoB land once future trail network extends to the Buninyong - Mt Mercer Road
- Wayfinding signage
- Kayak trail and associated facilities
- Development of wetlands at Winter Creek / Yarrowee River confluence
- Improvement of existing billabongs
- Priority Project 4 - Rural Trail Extension - upgrade reserve from Dowcra Street to Midland Highway. Carpark at Midland Highway - subject to authority consultation (including VicRoads)
- Indigenous revegetation of the river banks and aquatic zone
- Rescind grazing rights and licences to increase river corridor reserve land and corridor connectivity

Tell us your vision for the Yarrowee River corridor

*A fully revegetated and connected wildlife corridor from north of Ballarat to Garibaldi incorporating paths and reserves for community activity and education. Increased support to Landcare groups including site upkeep, bio monitoring and water watch*

MySay Survey Dec. 2019

# Rural Reach Scope and Reference



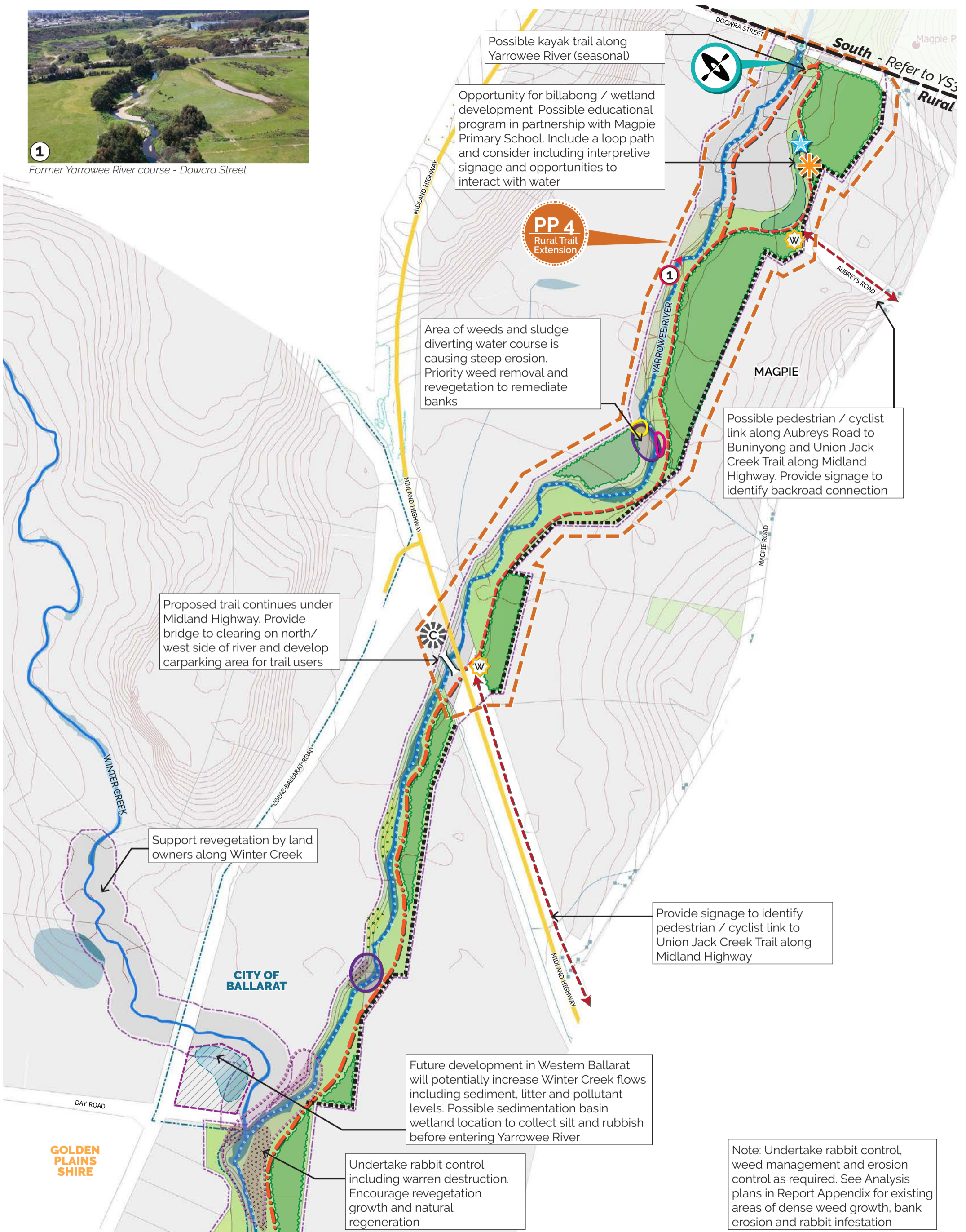
Extent of study area - location plan

- ### Legend
- City of Ballarat boundary
  - Extent of study
  - Waterbody
  - Yarrowee River
  - Major tributary
  - Minor tributary
  - Drainage channel
  - Yarrowee River - underground
  - Channelised waterway
  - Title boundary
  - Future title boundary
  - Contours (1m interval)
  - Public Open Space
  - Freeway
  - Railway line
  - Major on-road cycle path
  - Footpath
  - Major trail - hardstand surface
  - Major trail - gravel surface
  - Minor trail
  - Bridge
  - Drainage channel
  - Drainage pipe
  - Drainage pit
  - Q100 flood level (where mapped)
  - Playground
  - Toilet
  - Litter Bin
  - Picnic tables
  - Public furniture
  - Public lighting
  - Sign
  - PTV Bus Stop
  - PTV Regional Bus Route
  - Community facility
  - Education facility
  - Recreation facility
  - Aquatic facility

- ### Masterplan Legend
- Existing farm track within reserve
  - Existing steep bank
  - Newly planted revegetation
  - Former river bed / billabong
  - Existing rock shelf
  - Large rabbit warren
  - Proposed pedestrian / cyclist trail
  - Proposed maintenance access track / future trail
  - Improve pedestrian / cyclist link
  - Proposed pedestrian / maintenance bridge
  - Proposed stepping stone pedestrian river crossing
  - (Proposed) fence to title boundary
  - Proposed carpark
  - Proposed revegetation - trees and understorey
  - Proposed embankment revegetation
  - Priority weed management
  - Priority erosion control
  - Priority sludge management
  - Priority vermin control
  - Proposed wetland opportunity
  - Priority wayfinding signage upgrade
  - Proposed interpretative signage / feature
  - Opportunity for water interaction
  - Proposed trailhead
  - Proposed picnic area
  - Possible kayak launch / dismount point
  - Possible kayak route (seasonal)
  - Area requires further design / masterplanning
  - Crownland outside of river reserve - potential sale opportunity



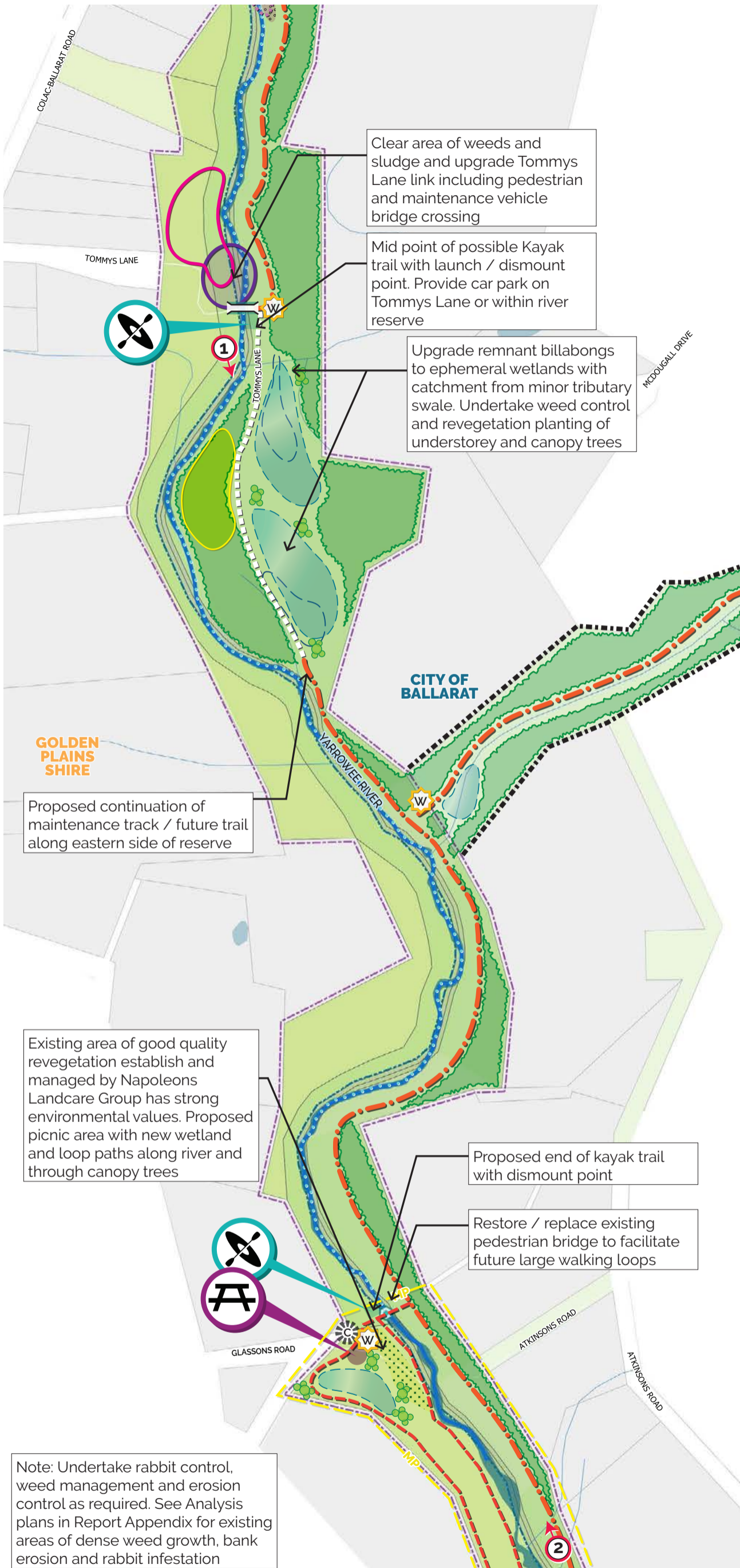
1 Former Yarrowee River course - Dowcra Street



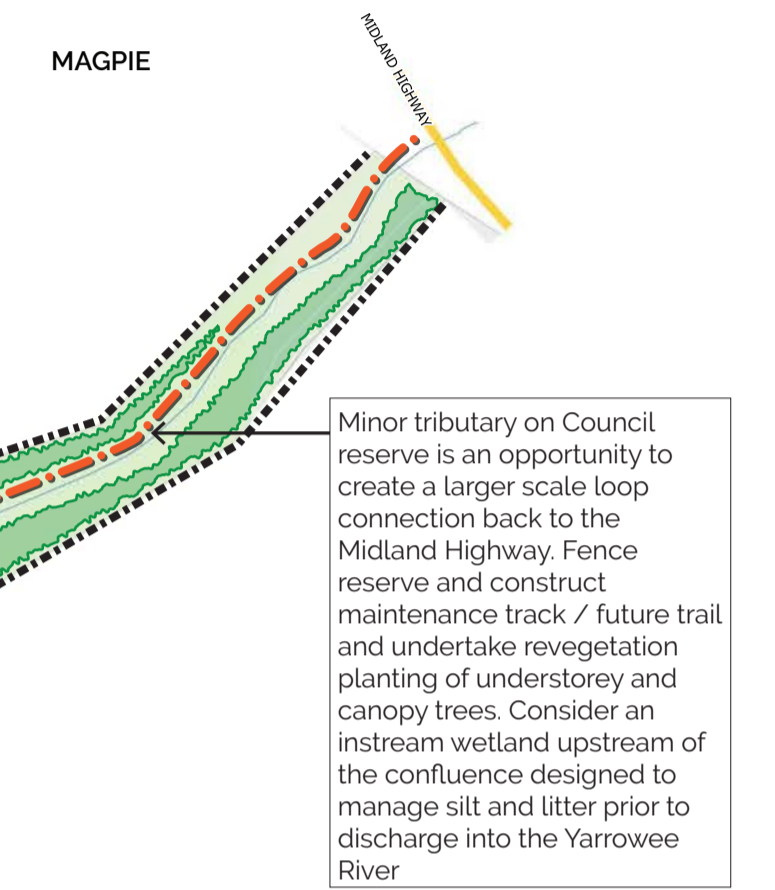
# Yarrowee River Rural Masterplan

Scale 1:5000 at A3





1 Tommy's Lane - large reserve area

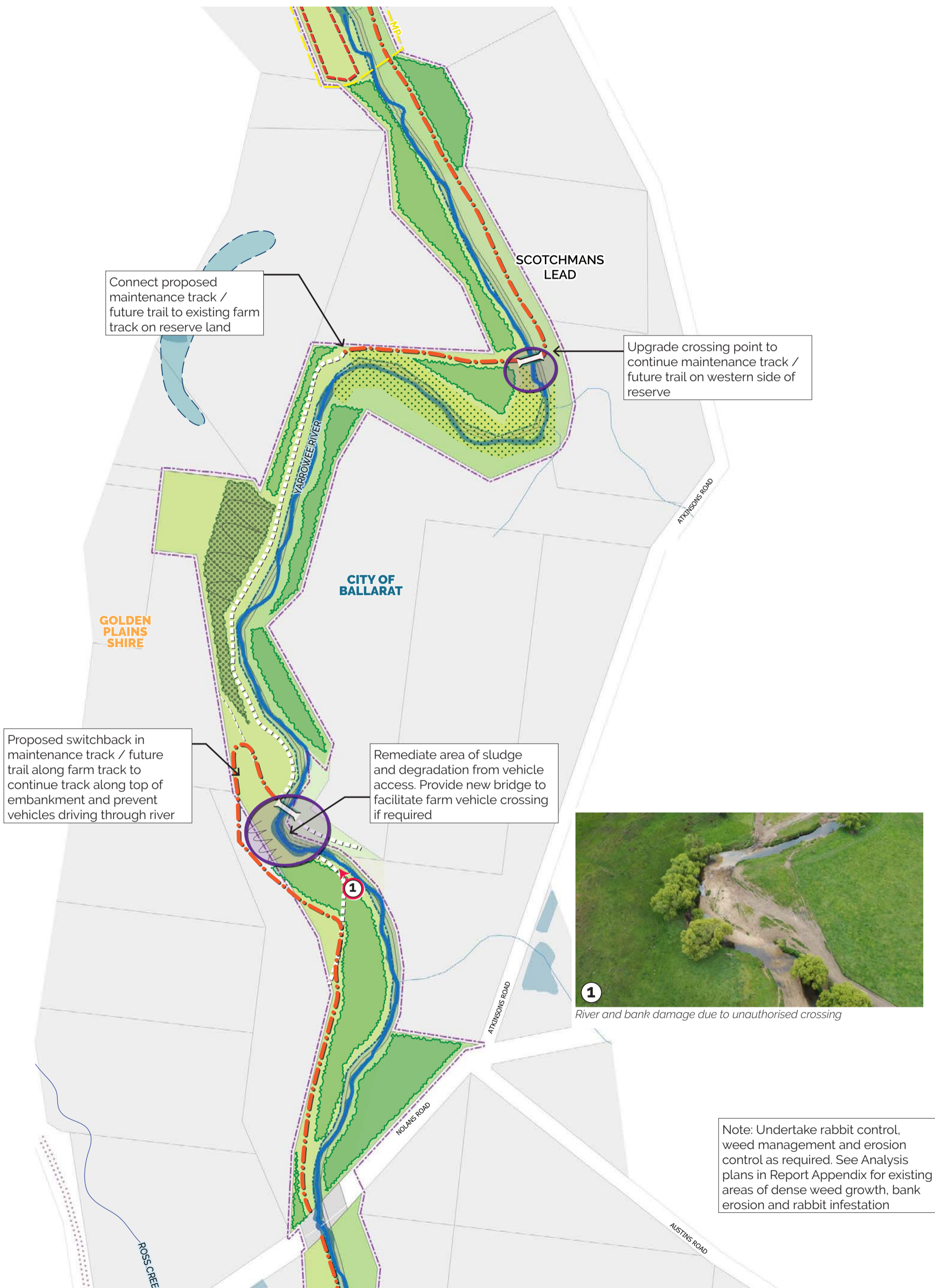


2 Area of revegetation - Glassons Road

# Yarrowee River Rural Masterplan

Scale 1:5000 at A3



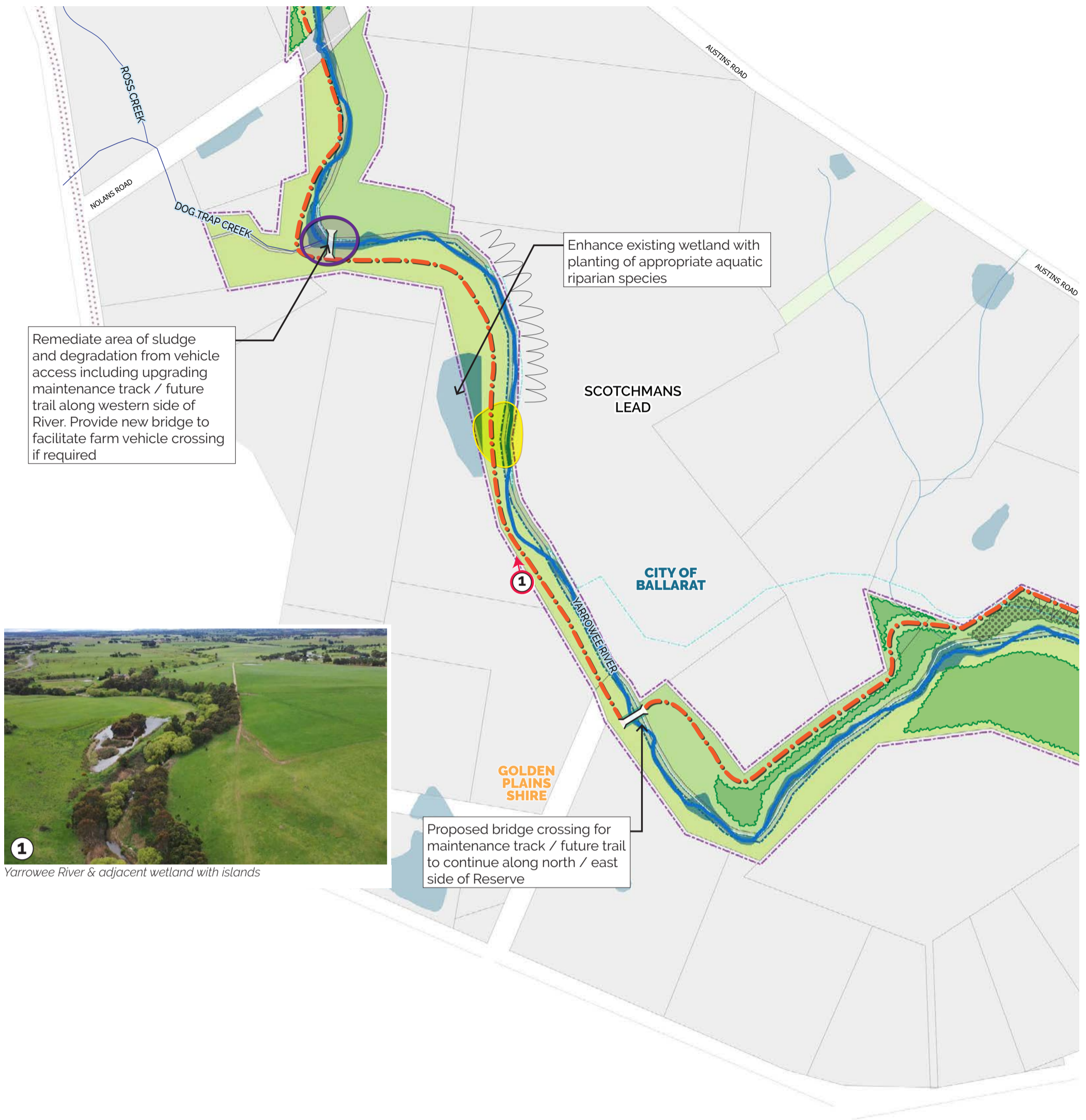


Yarrowee River Rural  
Masterplan

Scale 1:5000 at A3







1 Yarrowee River & adjacent wetland with islands

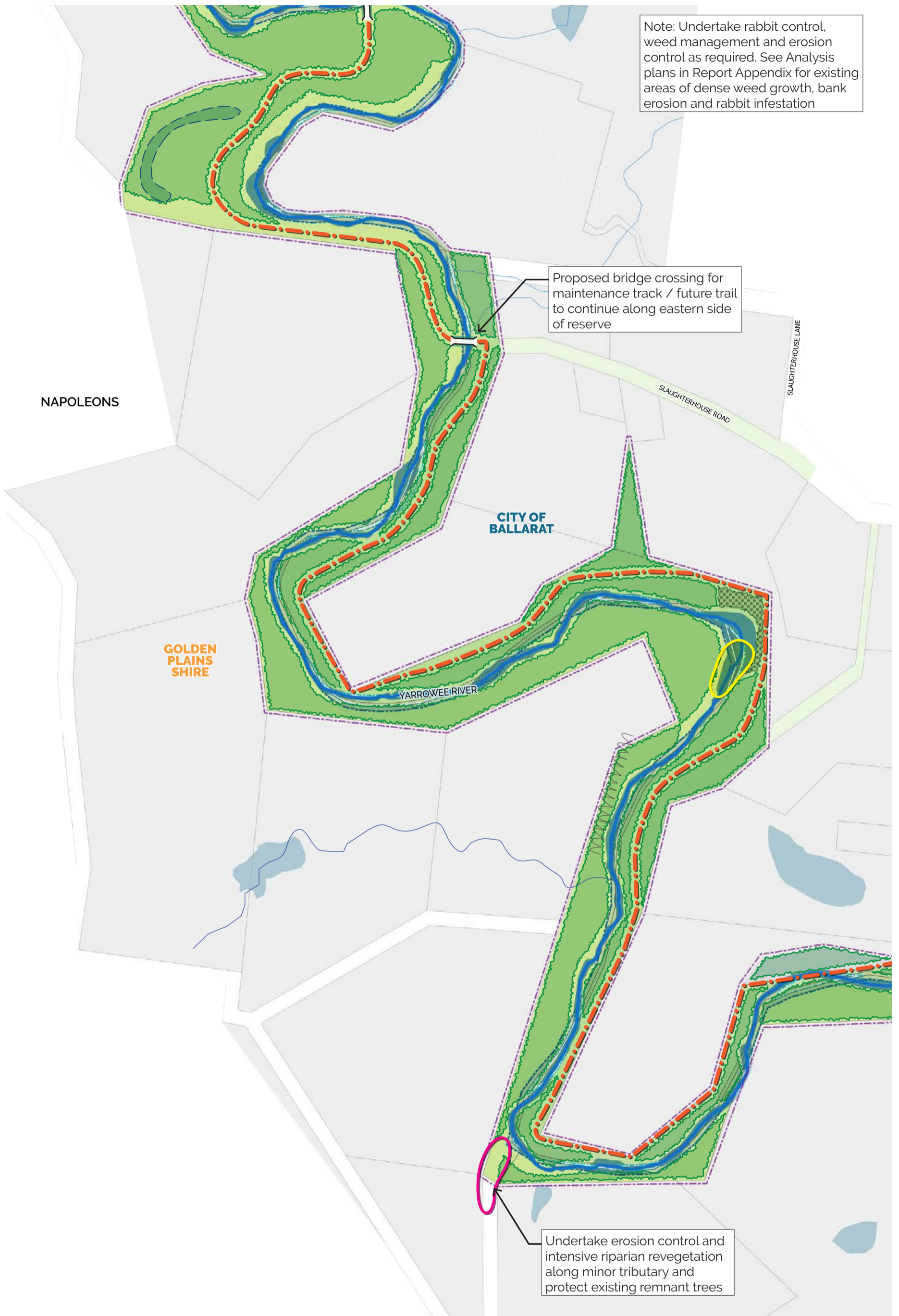
Note: Undertake rabbit control, weed management and erosion control as required. See Analysis plans in Report Appendix for existing areas of dense weed growth, bank erosion and rabbit infestation



Yarrowee River Rural  
Masterplan

Scale 1:5000 at A3



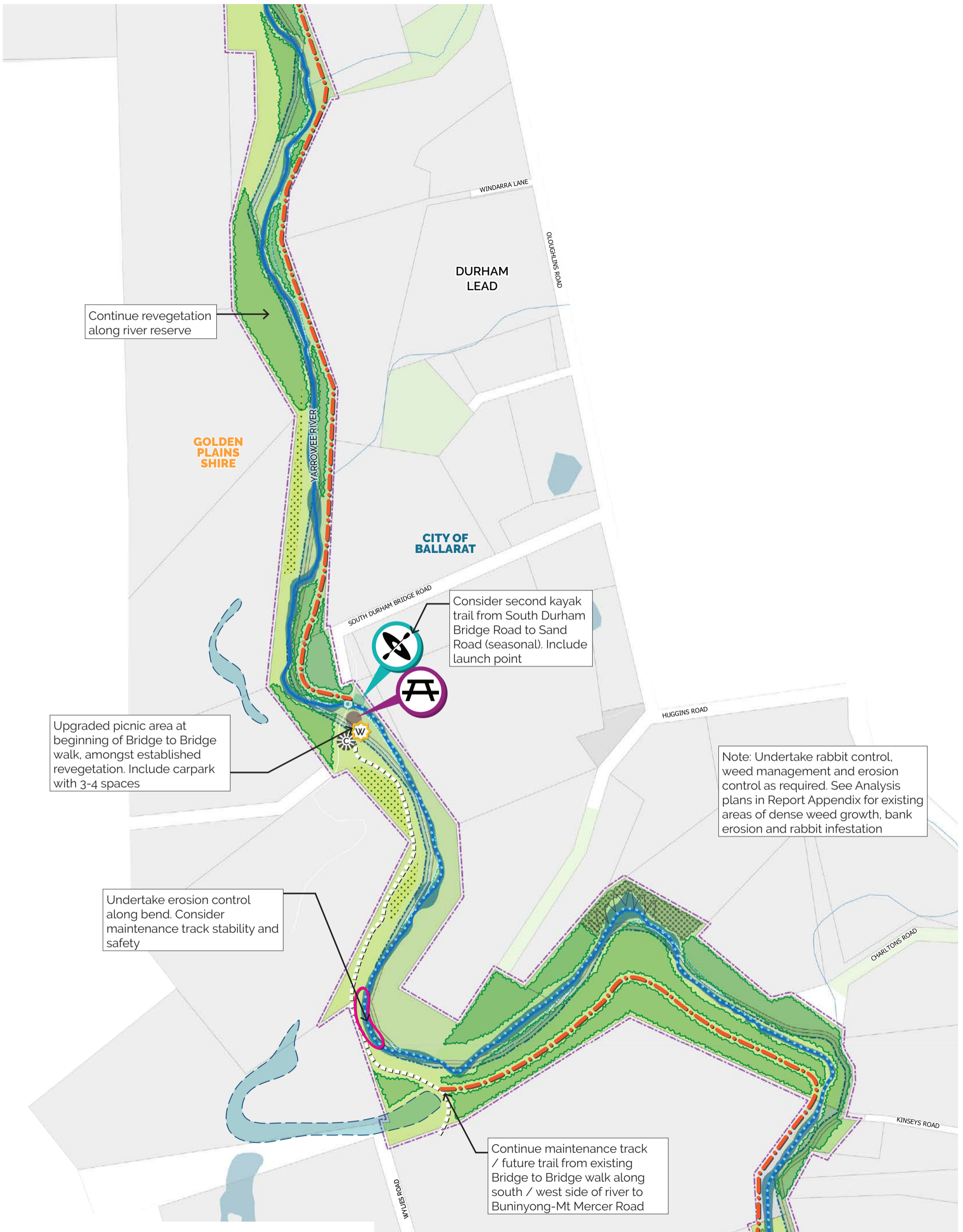




**Yarrowee River Rural**  
Masterplan

 Scale 1:5000 at A3

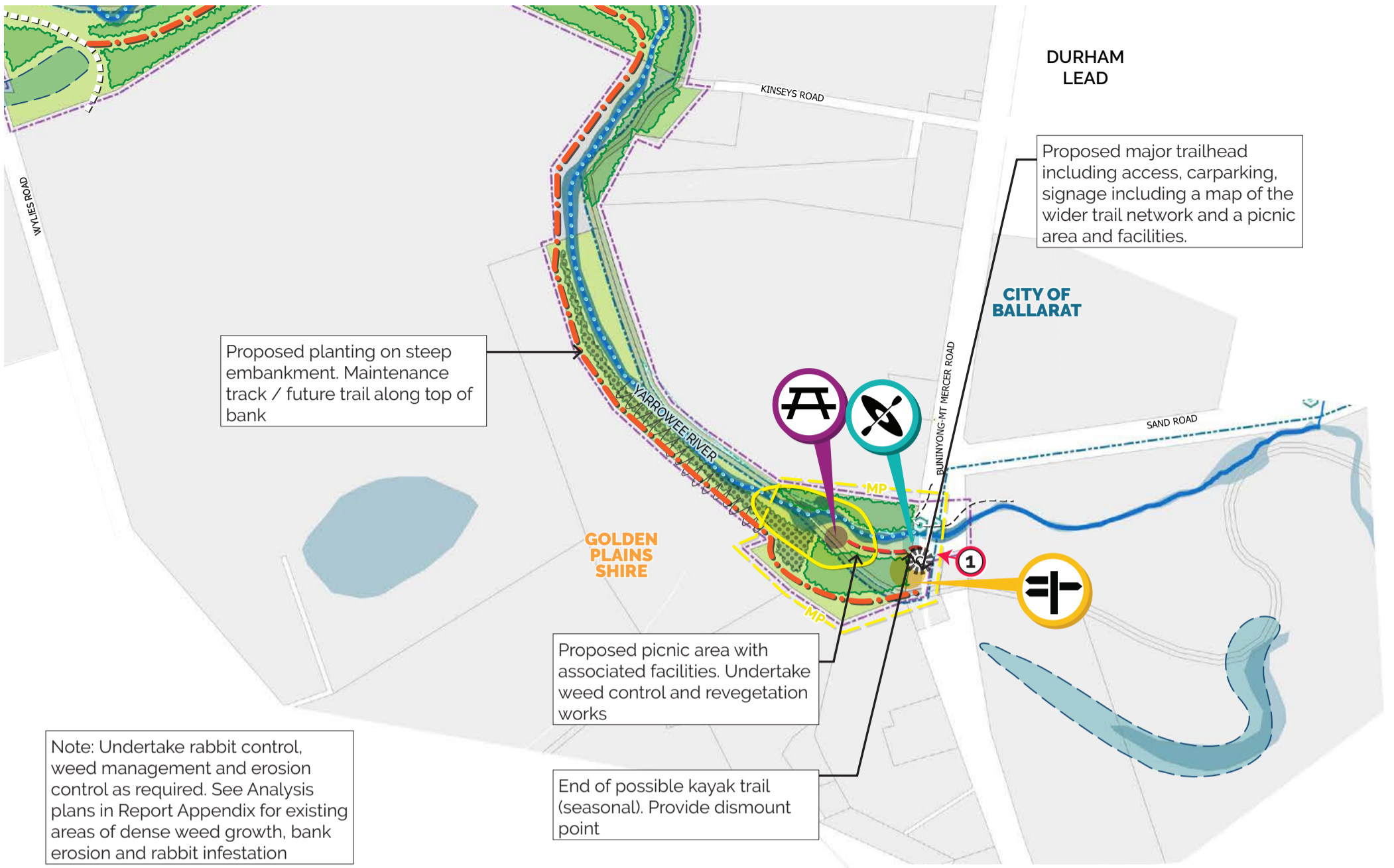




Yarrowee River Rural  
Masterplan

Scale 1:5000 at A3





Note: Undertake rabbit control, weed management and erosion control as required. See Analysis plans in Report Appendix for existing areas of dense weed growth, bank erosion and rabbit infestation



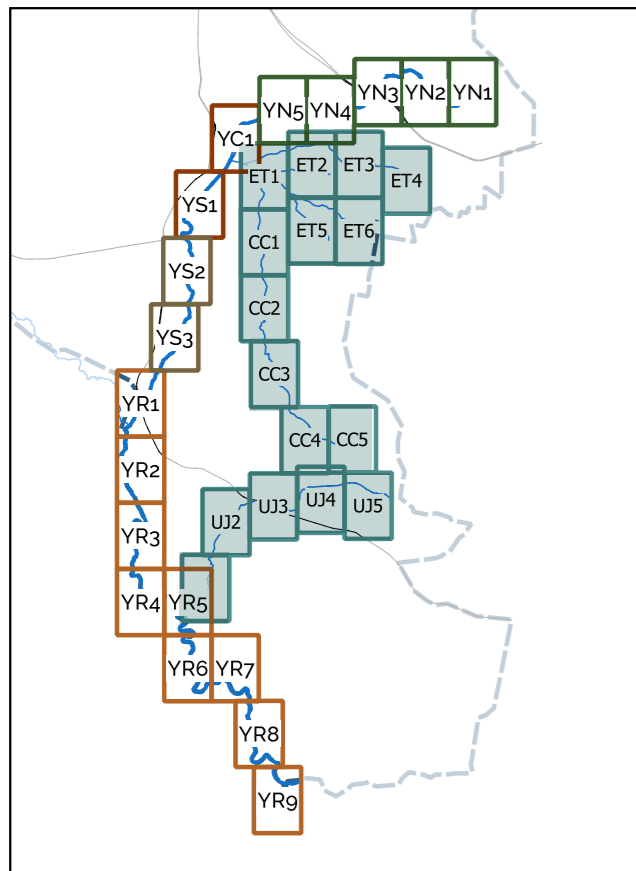
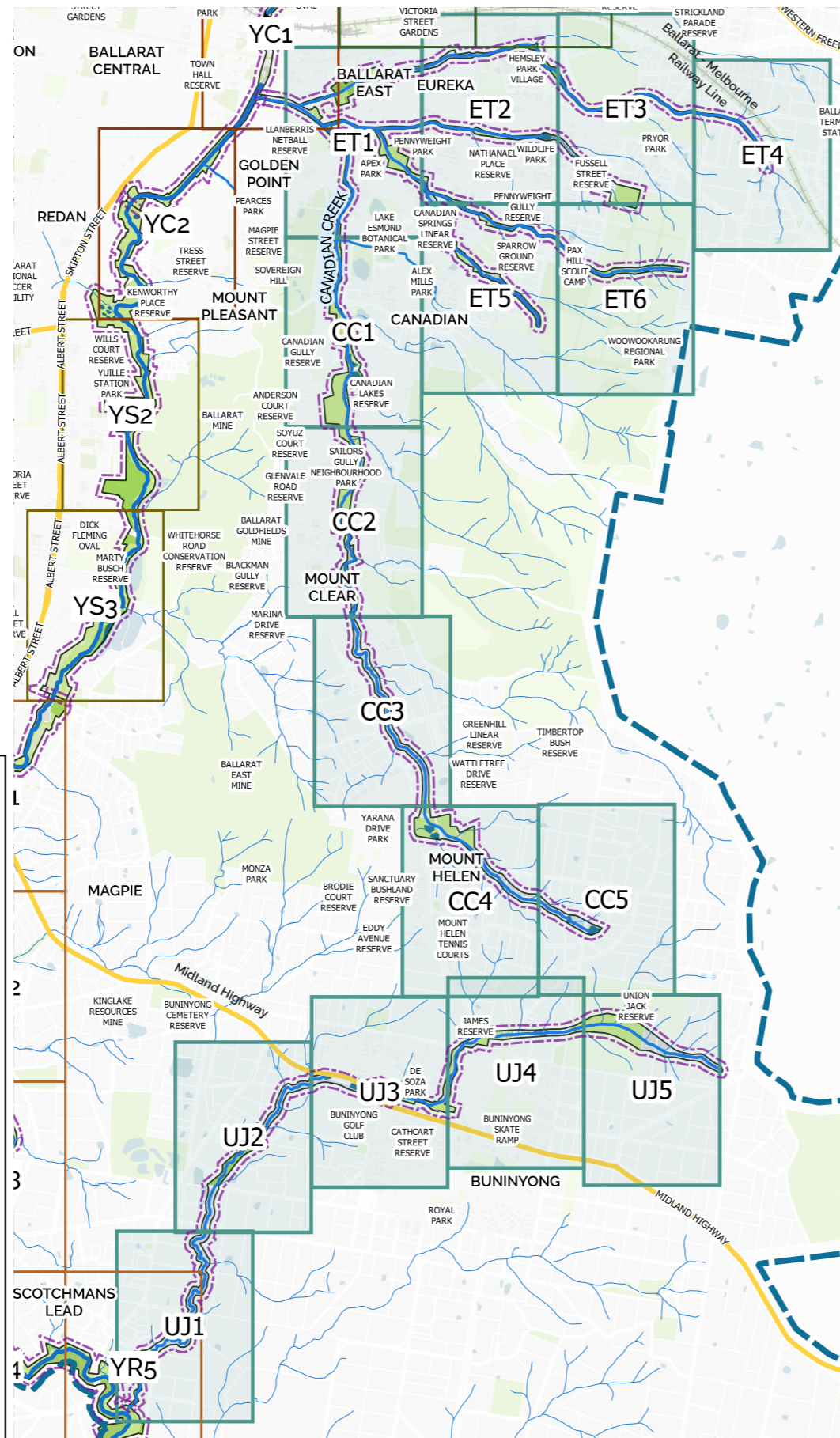
Large pool within River

Yarrowee River Tributaries



Canadian Creek at Canadian Lakes Estate, looking north towards Black Hill

# Tributaries Scope and Reference



## Legend

- City of Ballarat boundary
- Extent of study
- Waterbody
- Yarrowee River
- Major tributary
- Minor tributary
- Drainage channel
- Yarrowee River - underground
- Channelised waterway
- Title boundary
- Future title boundary
- Contours (1m interval)
- Public Open Space
- Freeway
- Railway line
- Major on-road cycle path
- Footpath
- Major trail - hardstand surface
- Major trail - gravel surface
- Minor trail
- Bridge
- Drainage channel
- Drainage pipe
- Drainage pit
- Q100 flood level (where mapped)
- Playground
- Toilet
- Litter Bin
- Picnic tables
- Public furniture
- Public lighting
- Sign
- PTV Bus Stop
- PTV Regional Bus Route
- Community facility
- Education facility
- Recreation facility
- Aquatic facility

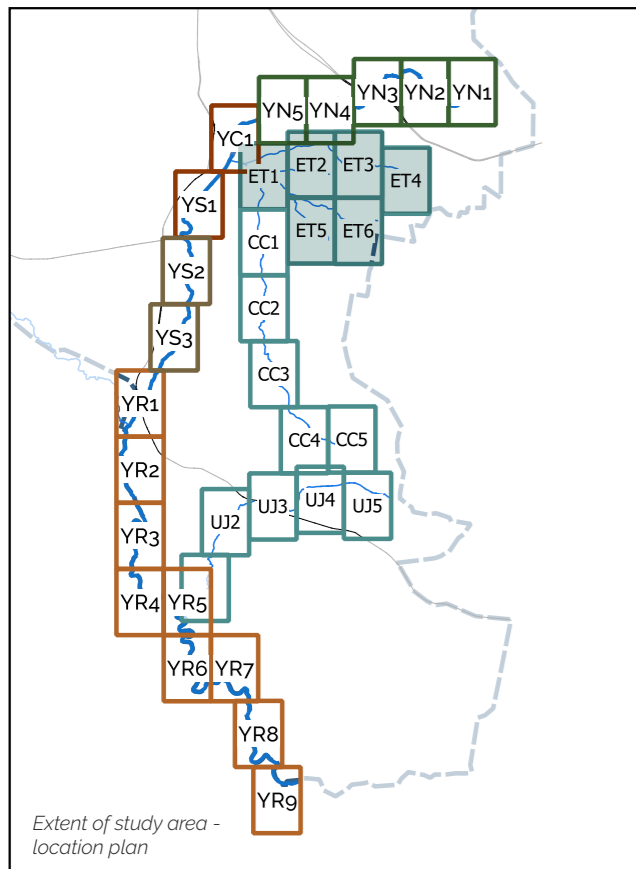
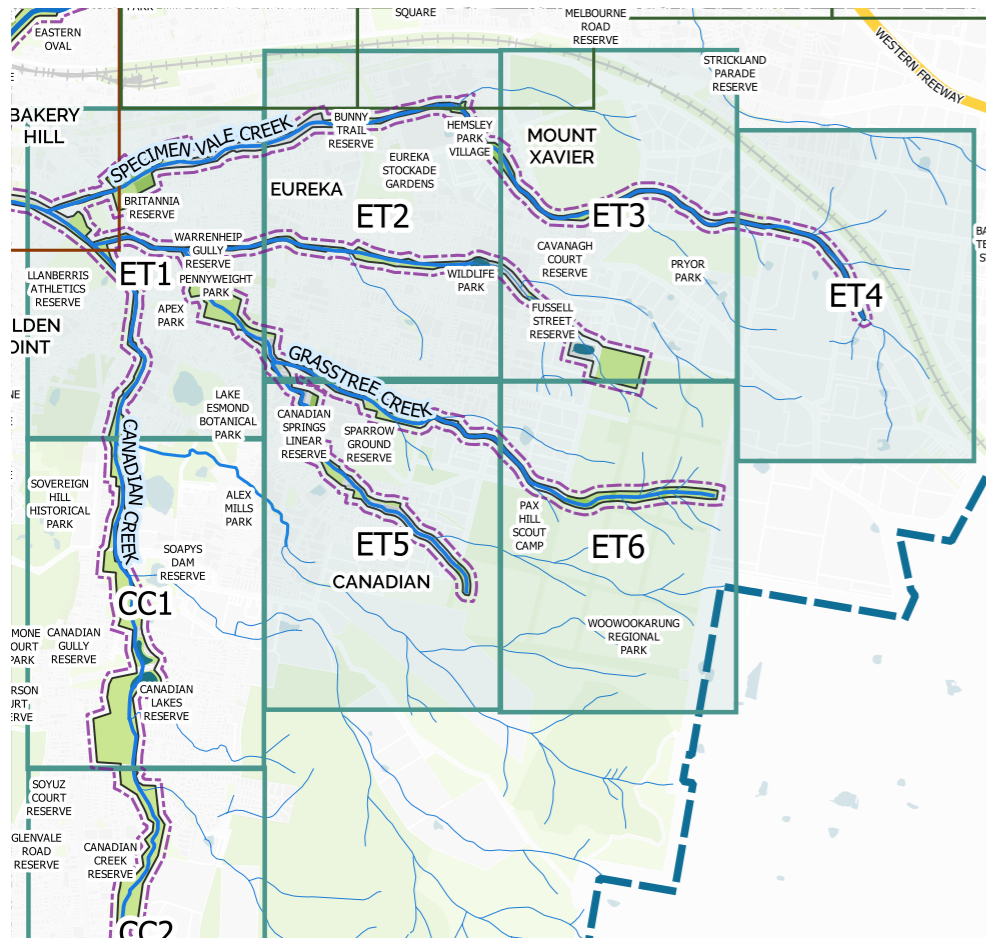
## Masterplan Legend

- Existing farm track within reserve
- Newly planted revegetation
- Existing rock shelf
- Contaminated soil
- Large rabbit warren
- Existing carpark
- Proposed pedestrian / cyclist trail
- Proposed maintenance access track / future trail
- Improve pedestrian / cyclist link
- Proposed pedestrian / maintenance bridge
- Proposed stepping stone pedestrian river crossing
- (Proposed) fence to title boundary
- Remove fence
- Proposed carpark
- Proposed revegetation - trees and understorey
- Proposed screen planting
- Proposed understorey revegetation
- Proposed canopy trees
- Proposed path / channel edge low planting
- Proposed instream revegetation
- Proposed 'Green Street' incl. canopy trees and WSUD
- Priority weed management
- Priority erosion control
- Priority vermin control
- Proposed wetland opportunity
- Priority wayfinding signage upgrade
- Proposed interpretative signage / feature
- Proposed interpretive trail
- Proposed pocket park
- Possible Active Transport Link carpark
- Off-leash dog park
- Woookarung Regional Park Neighbourhood Forest Trailhead
- Area requires further design / masterplanning



# Eastern Tributaries

Canadian Creek (Part), Specimen Vale Creek, Warrenheip Gully, Grasstree Creek and Pennyweight Gully



A mix of native and exotic trees edge the Canadian Creek channel near Eureka Street.



Car parking under large exotic trees in Steinfield Street, Canadian Creek channel.



Warrenheip Creek channel on Callow Street



Warrenheip Creek behind the back fences of houses



Dog walkers along Warrenheip Creek



Weedy industrial area on Specimen Vale Creek, with some remnant indigenous vegetation



Specimen Vale Creek underground section at Hemsley Park Country Club



Open fence types provide views to Specimen Vale Creek

## Landscape character & general conditions

Specimen Vale Creek, Warrenheip Gully, Grasstree Creek and Pennyweight Gully are small ephemeral creeks and tributaries of the Canadian Creek (there are 11 tributaries in total). Specimen Vale Creek and Warrenheip Gully are two valleys that run roughly parallel east to west and drain the area of Ballarat East. Pennyweight Gully and Grasstree Creek rise in the Woowookarung Regional Park, flowing through the suburbs of Canadian and Ballarat East before joining Warrenheip Gully, Canadian Creek and the Yarrowee River.

The surrounding area is mostly residential with some commercial and industrial areas. Specimen Vale Creek flows through or past Mt Xavier Golf Course, the former Ballarat East Town Hall Gardens and under LT Fraser Reserve. Warrenheip Gully flows through the Ballarat Wildlife Park and Llanberris Athletics Reserve. Grasstree Creek flows through Sparrow Ground Reserve.

The creeks form gentle valleys in an undulating landscape, becoming hillier in the forest area of Woowookarung Regional Park.

A well used trail runs along each creek (mostly granitic sand). There is a reasonable reserve width either side (average 20m wide, and much wider in some areas). The creeks are sometimes at the back of residential properties and sometimes adjoining a road reserve.

The EVC along Specimen Vale Creek and Warrenheip Gully is Swampy Riparian Woodland; and Grasstree Creek and Pennyweight Gully is Valley Grassy Forest. Vegetation along the river corridor is mostly native, and the surrounding area has a diversity of exotic and native trees in the streetscapes. The vegetation ranges from areas of weed infestation to high quality indigenous / remnant vegetation. There is an area of relatively intact indigenous vegetation, including many wildflowers, along Grasstree Creek in the forested and grassy section between Kline and Richards Streets.

Like the Yarrowee River, the health of the tributary creeks has been adversely impacted by gold mining activities and urban development. Unfortunately several developments have occurred over the waterway, discontinuing the river corridor. Some sections have been piped, limiting the environmental and recreational values of the waterway.

The Ballarat East area has significant cultural and built heritage, and environmental values. Planning policy / controls should be reviewed and development to ensure development along the river corridor enhances these values.

## Assessment of the 1995 Masterplan

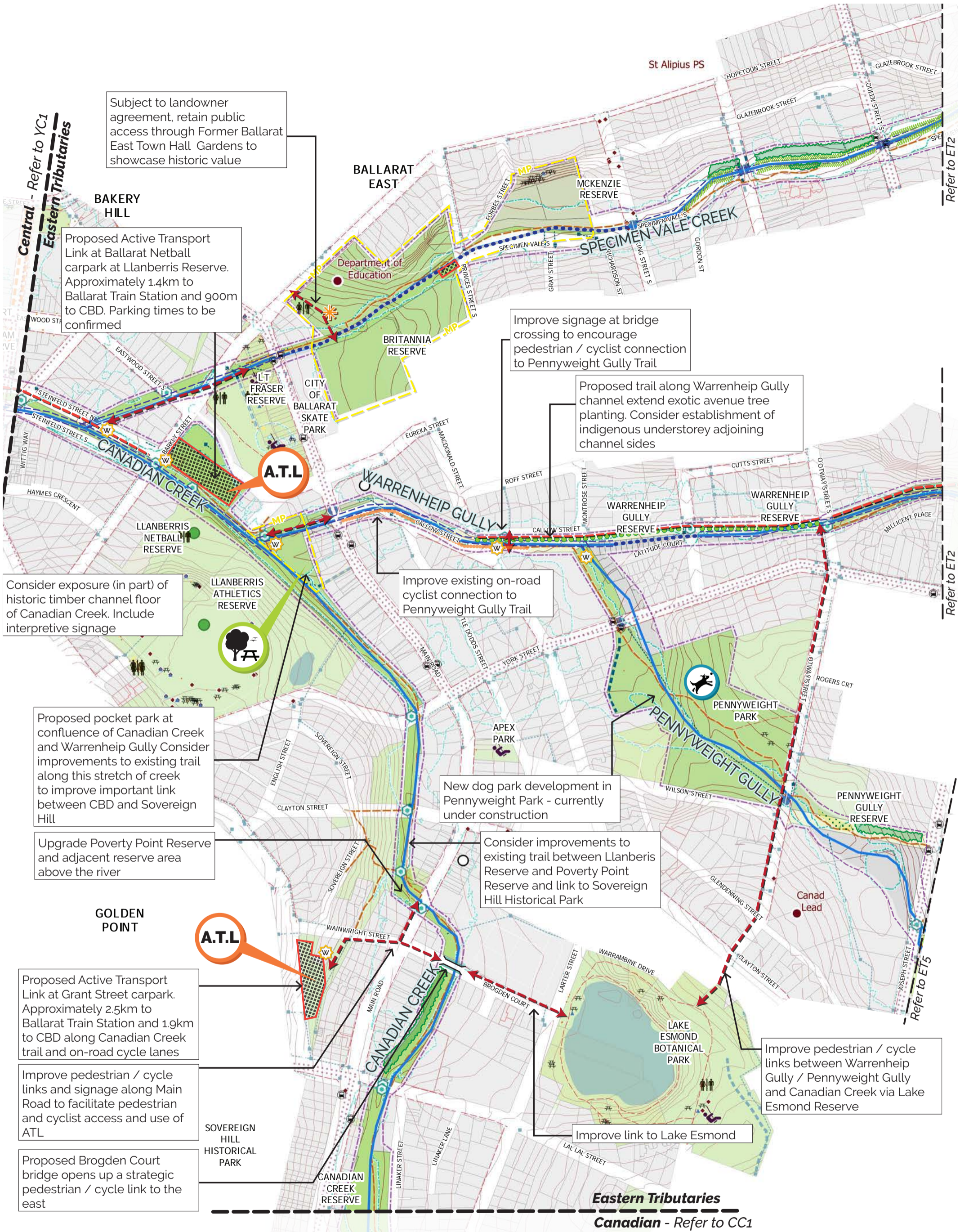
Canadian Creek, Specimen Vale Creek, Warrenheip Gully, Pennyweight Gully and Grasstree Creek are outside of the scope of the 1995 Masterplan. There has been extensive revegetation on these creeks and gullies.

## Overview of recommendations for the Eastern Tributary Reach

The following is an overview of the recommendations for this reach. Refer to the plans and the detailed recommendations in the front of this report for more information.

The following improvements are recommended:

- Provide Active Transport Links to improve connection to Ballarat CBD and WRP
- Provide links between creek trails to create larger loops.
- Provide recreational and social spaces along the river corridor
- Develop masterplans for larger reserves adjoining the creek corridor
- Protect and enhance environmental values including remnant indigenous vegetation
- Weed control, indigenous revegetation and vegetation management
- Review and develop planning controls to preserve and enhance the natural, cultural and built heritage, and environmental values of all tributaries



Subject to landowner agreement, retain public access through Former Ballarat East Town Hall Gardens to showcase historic value

Proposed Active Transport Link at Ballarat Netball carpark at Llanberis Reserve. Approximately 1.4km to Ballarat Train Station and 900m to CBD. Parking times to be confirmed

Improve signage at bridge crossing to encourage pedestrian / cyclist connection to Pennyweight Gully Trail

Proposed trail along Warrenheip Gully channel extend exotic avenue tree planting. Consider establishment of indigenous understorey adjoining channel sides

Consider exposure (in part) of historic timber channel floor of Canadian Creek. Include interpretive signage

Improve existing on-road cyclist connection to Pennyweight Gully Trail

Proposed pocket park at confluence of Canadian Creek and Warrenheip Gully Consider improvements to existing trail along this stretch of creek to improve important link between CBD and Sovereign Hill

New dog park development in Pennyweight Park - currently under construction

Upgrade Poverty Point Reserve and adjacent reserve area above the river

Consider improvements to existing trail between Llanberis Reserve and Poverty Point Reserve and link to Sovereign Hill Historical Park

Proposed Active Transport Link at Grant Street carpark. Approximately 2.5km to Ballarat Train Station and 1.9km to CBD along Canadian Creek trail and on-road cycle lanes

Improve pedestrian / cycle links between Warrenheip Gully / Pennyweight Gully and Canadian Creek via Lake Esmond Reserve

Improve pedestrian / cycle links and signage along Main Road to facilitate pedestrian and cyclist access and use of ATL

Improve link to Lake Esmond

Proposed Brogden Court bridge opens up a strategic pedestrian / cycle link to the east

**Eastern Tributaries**  
**Canadian - Refer to CC1**

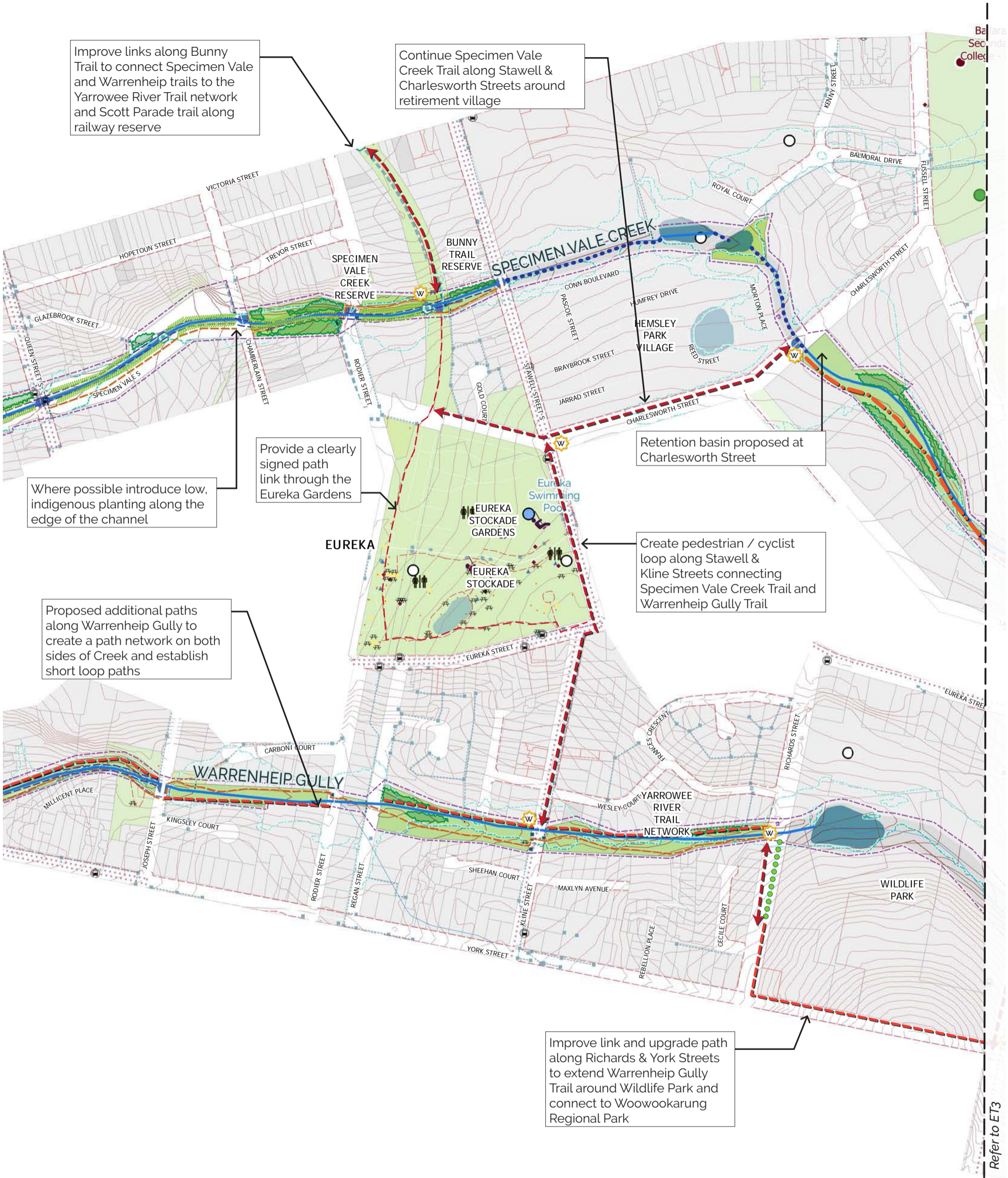
# Eastern Tributaries

Canadian Creek, Specimen Vale Creek, Warrenheip Gully & Pennyweight Gully

## Masterplan

Scale 1:5000 at A3





Improve links along Bunny Trail to connect Specimen Vale and Warrenheip trails to the Yarrowee River Trail network and Scott Parade trail along railway reserve

Continue Specimen Vale Creek Trail along Stawell & Charlesworth Streets around retirement village

Provide a clearly signed path link through the Eureka Gardens

Retention basin proposed at Charlesworth Street

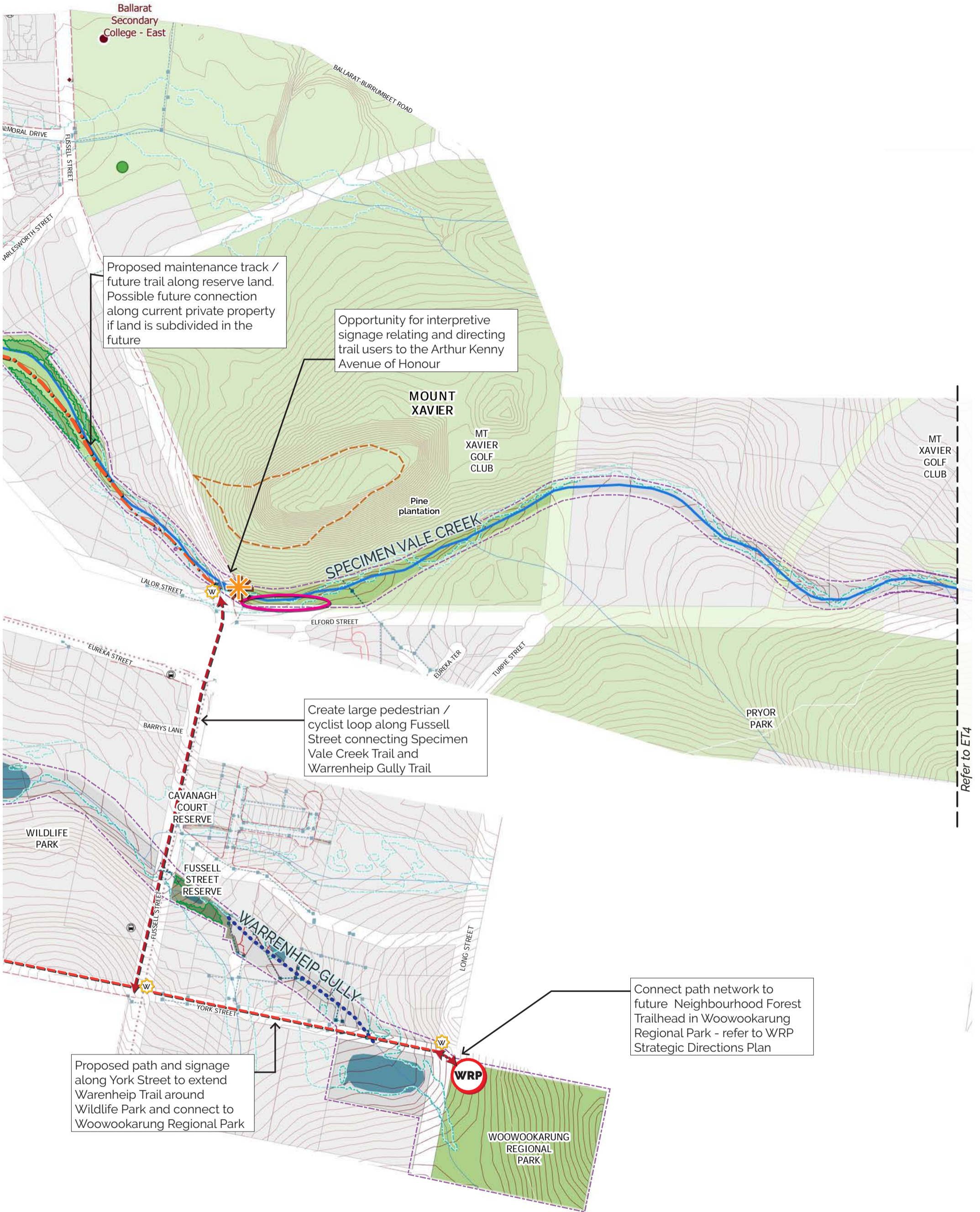
Create pedestrian / cyclist loop along Stawell & Kline Streets connecting Specimen Vale Creek Trail and Warrenheip Gully Trail

Proposed additional paths along Warrenheip Gully to create a path network on both sides of Creek and establish short loop paths

Where possible introduce low, indigenous planting along the edge of the channel

Improve link and upgrade path along Richards & York Streets to extend Warrenheip Gully Trail around Wildlife Park and connect to Woowookarung Regional Park

Refer to ET3



Refer to ET4

# Eastern Tributaries

Specimen Vale Creek & Warrenheip Gully  
Masterplan

Scale 1:5000 at A3





WARRENHEIP

Support fencing, weed control and indigenous revegetation on private land to improve overall catchment and instream ecological health

# Eastern Tributaries

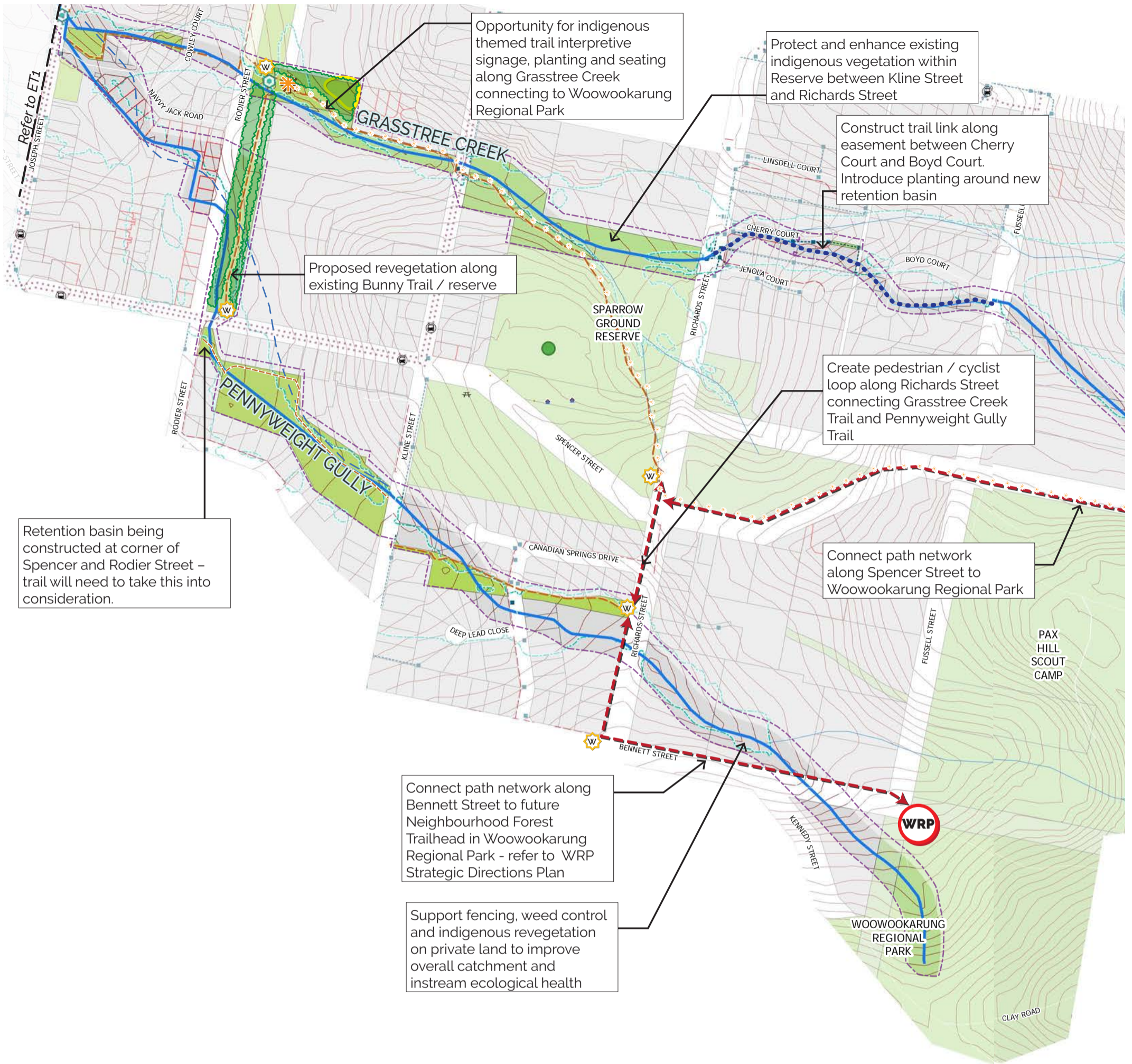
Specimen Vale Creek

Masterplan



Scale 1:5000 at A3





Opportunity for indigenous themed trail interpretive signage, planting and seating along Grasstree Creek connecting to Woowookarung Regional Park

Protect and enhance existing indigenous vegetation within Reserve between Kline Street and Richards Street

Construct trail link along easement between Cherry Court and Boyd Court. Introduce planting around new retention basin

Proposed revegetation along existing Bunny Trail / reserve

Create pedestrian / cyclist loop along Richards Street connecting Grasstree Creek Trail and Pennyweight Gully Trail

Retention basin being constructed at corner of Spencer and Rodier Street - trail will need to take this into consideration.

Connect path network along Spencer Street to Woowookarung Regional Park

Connect path network along Bennett Street to future Neighbourhood Forest Trailhead in Woowookarung Regional Park - refer to WRP Strategic Directions Plan

Support fencing, weed control and indigenous revegetation on private land to improve overall catchment and instream ecological health

# Eastern Tributaries

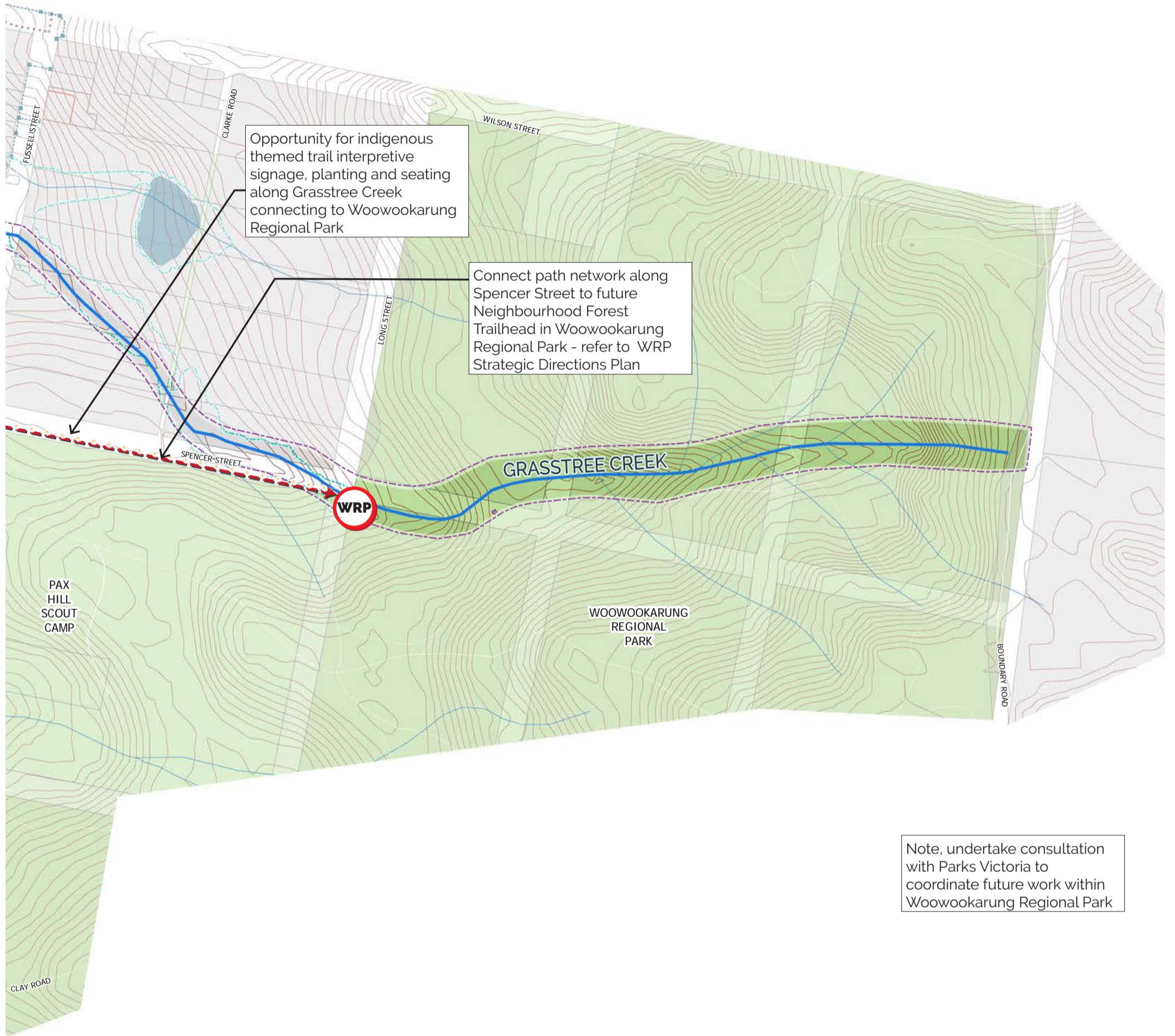
Grasstree Creek & Pennyweight Gully

## Masterplan



Scale 1:5000 at A3





Note, undertake consultation with Parks Victoria to coordinate future work within Woowookarung Regional Park

# Eastern Tributaries

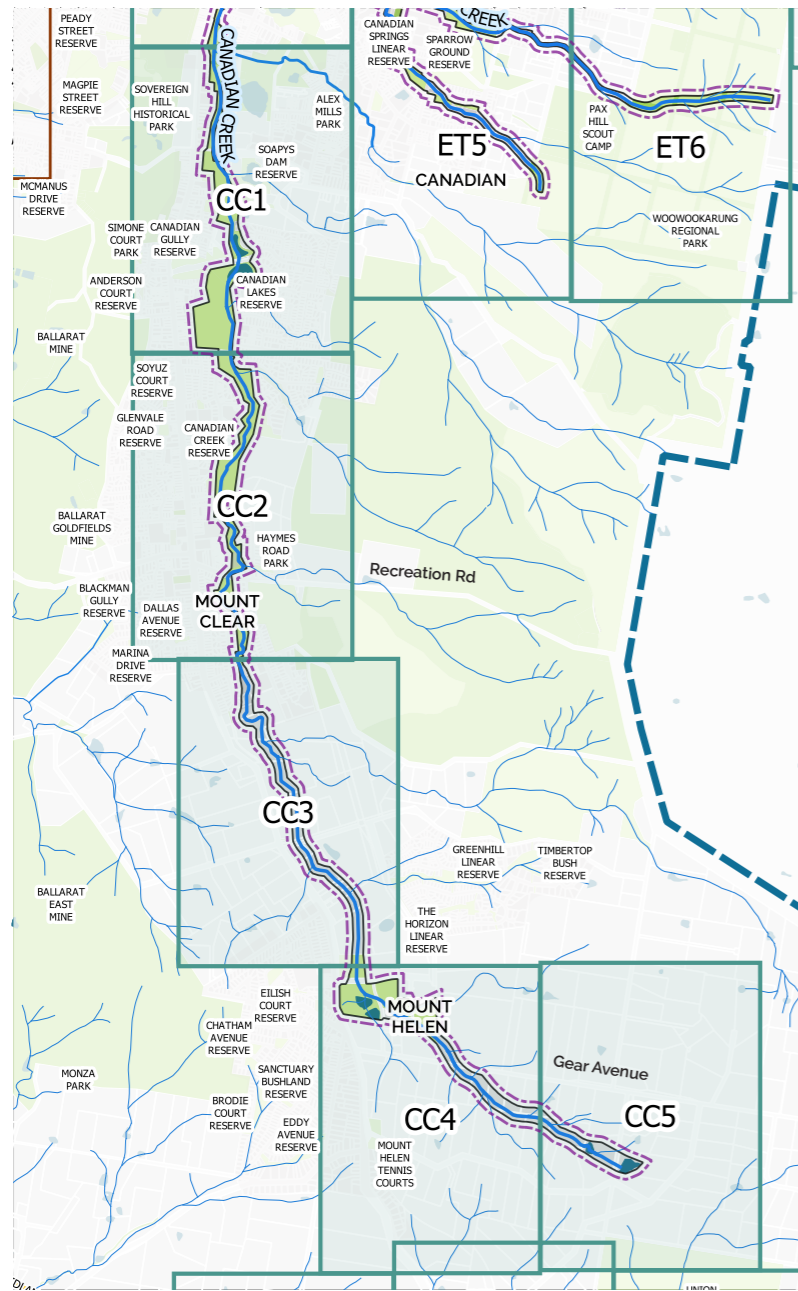
Grasstree Creek  
Masterplan



Scale 1:5000 at A3



# Canadian Creek



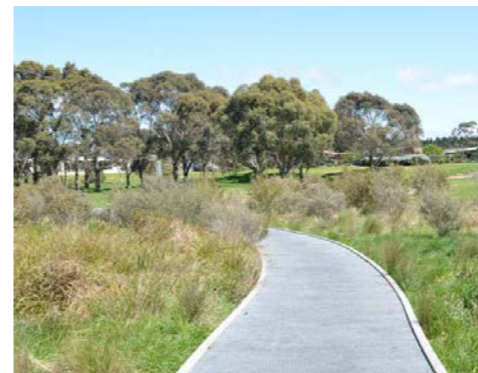
Remnant vegetation near Sully Court



Areas of dense vegetation



Playground in the creek corridor



Boardwalk over wetland at Canadian Lakes



Canadian Lakes wetland



Canadian Creek flows through the grounds of Mecure Hotel and provides a feature within this function centre



Wide reserve has opportunities for revegetation



Lots backing on to the Canadian Creek

## Landscape character & general conditions

Canadian Creek rises near Green Hill in Mount Helen. It flows through semi rural private land, and then becomes a generous linear reserve through the residential areas of Mount Helen, Mount Clear, Canadian and Golden Point.

The Canadian Creek adjoins a variety of recreational, educational and cultural facilities including Federation University, several schools (including Damascus College, Emmaus Primary School, Mount Clear Secondary College), reserves, hotels (including Mecure Hotel and Convention Centre), and tourist attractions such as Sovereign Hill.

Warrenheip Gully and Specimen Vale Creek join the Canadian Creek from Ballarat East. Several small tributaries join the Canadian Creek from the Woowookarung Regional Park including the Lal Lal Drain.

The Canadian Creek reserve feels like an oasis, a gentle valley with a wide flood plain in places, generally well vegetated and has a well used trails. The total width of the reserve varies between 15 – 200m with an average width of around 30m. Unfortunately, the reserve and trail terminates abruptly at Olympic Avenue where the creek enters private land.

The EVC classification mostly as Valley Grassy Forest. The upper reaches of the Canadian Creek have some intact patches of remnant indigenous vegetation. A small section of native Heathy Dry Forest occurs on the riverside at the western end of Sully Court. This could be restored and improved.

The Canadian Lakes wetlands enhance the environmental and recreational values of the river corridor and this model should generally be followed as urban development continues.

The river corridor becomes highly modified as it approaches central Ballarat. The creek is a concrete / bluestone channel and includes a section of channel with a historic timber floor. Vegetation is a mix of native and exotic species. Productive trees have been planted alongside the channel in some areas.

There is an opportunity to highlight the history of the gold rush along the Canadian Creek trail, including the first discovery of gold in Ballarat at Poverty Point.

## Assessment of the 1995 Masterplan

Canadian Creek is outside of the scope of the 1995 Masterplan.

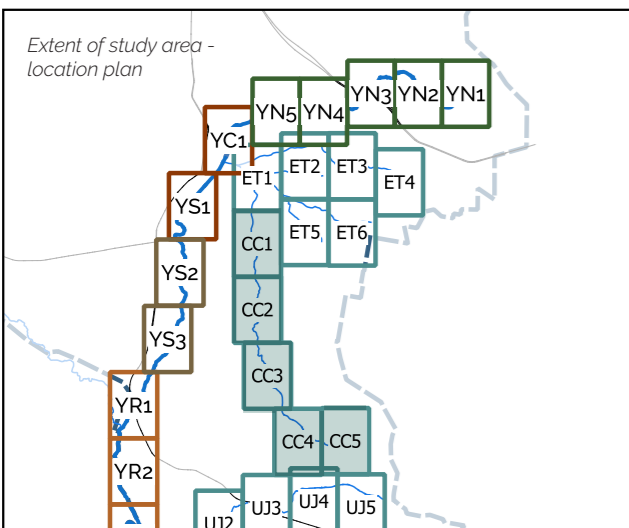
From Mt Clear north into urban Ballarat there has been much successful planting in the LINC period and before. The result is an attractive forested streamside environment.

## Overview of recommendations for the Canadian Creek Reach

The following is an overview of the recommendations for this reach. Refer to the plans and the detailed recommendations in the front of this report for more information.

The following improvements are recommended:

- Protect and enhance the riparian corridor, including pest and weed control, erosion control and indigenous revegetation on public and private land
- Improve pedestrian / cycle links to nearby recreational, educational and cultural facilities
- Provide pedestrian / cycle links to Woowookarung Regional Park
- Ecological corridors between the Canadian Creek and Woowookarung Regional Park
- Opportunity to develop creek corridor reserve if private / farm land is rezoned / subdivided
- Review and develop planning controls to preserve and enhance the natural, cultural and built heritage, and environmental values of all tributaries





**Eastern Tributaries - Refer to ET1**

**Canadian Creek**

Note: Undertake weed management and erosion control as required. See Analysis plans in Report Appendix for existing areas of dense weed growth and bank erosion

Opportunity to provide a path link between the Canadian creek trail and Lake Esmond and through degraded reserve. Investigate opportunity of a land swap to allow the water body to be in full public ownership

Prepare a management plan for Lal Lal Drain including the stretch between Rodier and Joseph Street

SOVEREIGN HILL HISTORICAL PARK

Connect path network along Elsworth Street to future Main Visitor Site and Neighbourhood Forest Trailhead in Woowookarung Regional Park - refer to WRP Strategic Directions Plan. Create a 'Green Street' along Elsworth Street including WSUD, street tree planting, defined paths and signage

Investigate existing industrial zones land at Soapys Dam. Investigate benefits of purchasing the land in south-east corner of reserve to consolidate the public open space. Exclude industrial land use from reserve. Provide bridge over Canadian Creek and paths through reserve to link to Woowookarung Regional Park



Ecological corridor (WRP)

Proposed revegetation to improve ecological corridor to Woowookarung Regional Park

Prepare a management plan for Soapys Dam Creek

Proposed trail on western side of creek to improve connectivity and create loop path opportunity

Proposed canopy trees along existing paths and around wetlands



Proposed Masterplan required to upgrade Canadian Creek Reserve parkland. Consider creating wetlands in swampy, low-lying areas, loop trails and indigenous revegetation including canopy trees along paths and around wetlands

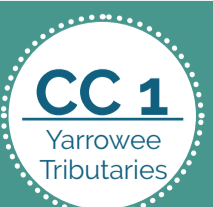
Connect path network along Canadian Lakes Boulevard to future Main Visitor Site and Neighbourhood Forest Trailhead in Woowookarung Regional Park - refer to WRP Strategic Directions Plan

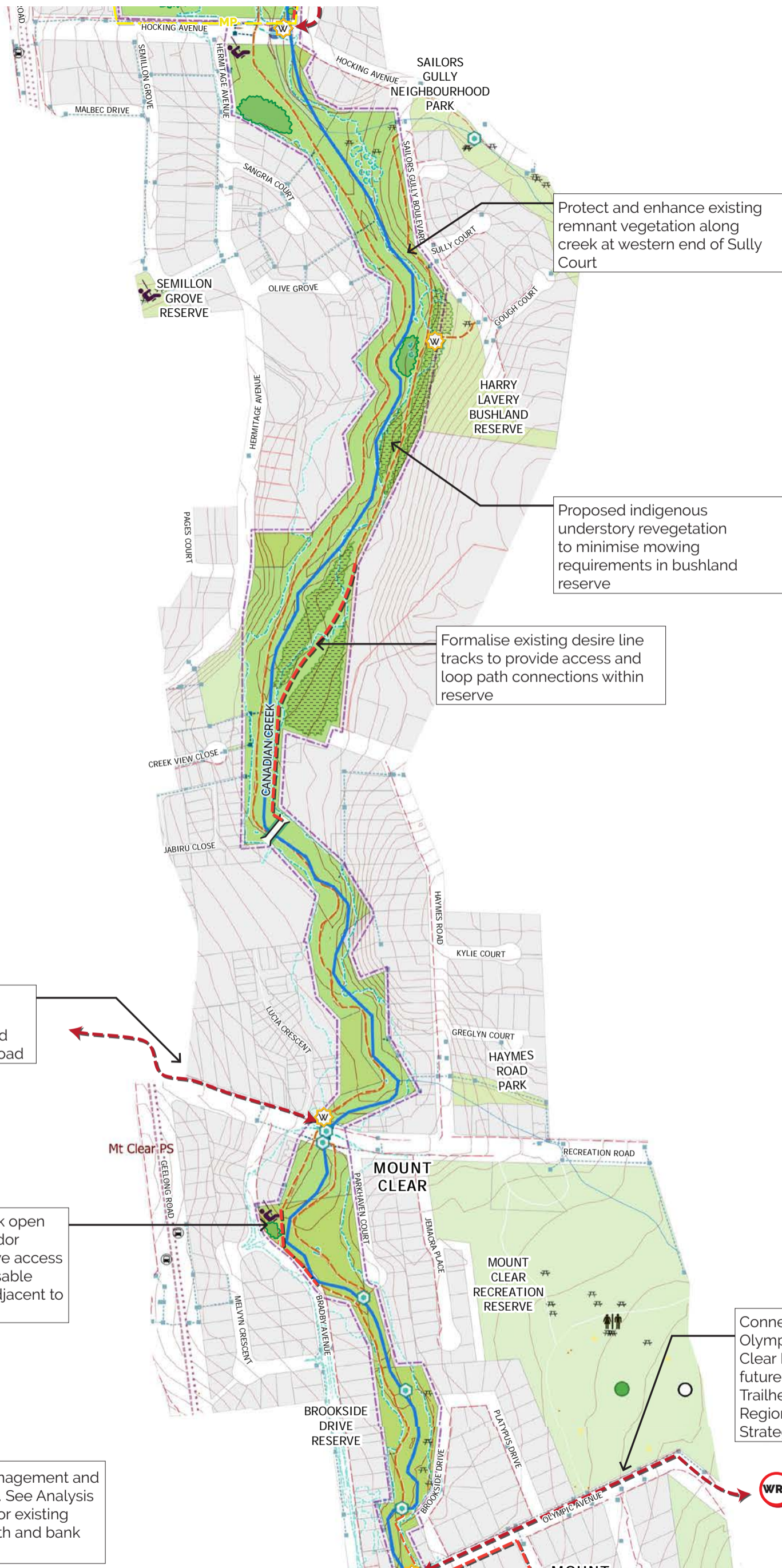
Connect path network along Hocking Avenue & Horwood Drive to future Main Visitor Site and Neighbourhood Forest Trailhead in Woowookarung Regional Park - refer to WRP Strategic Directions Plan



**Canadian Creek Masterplan**

Scale 1:5000 at A3

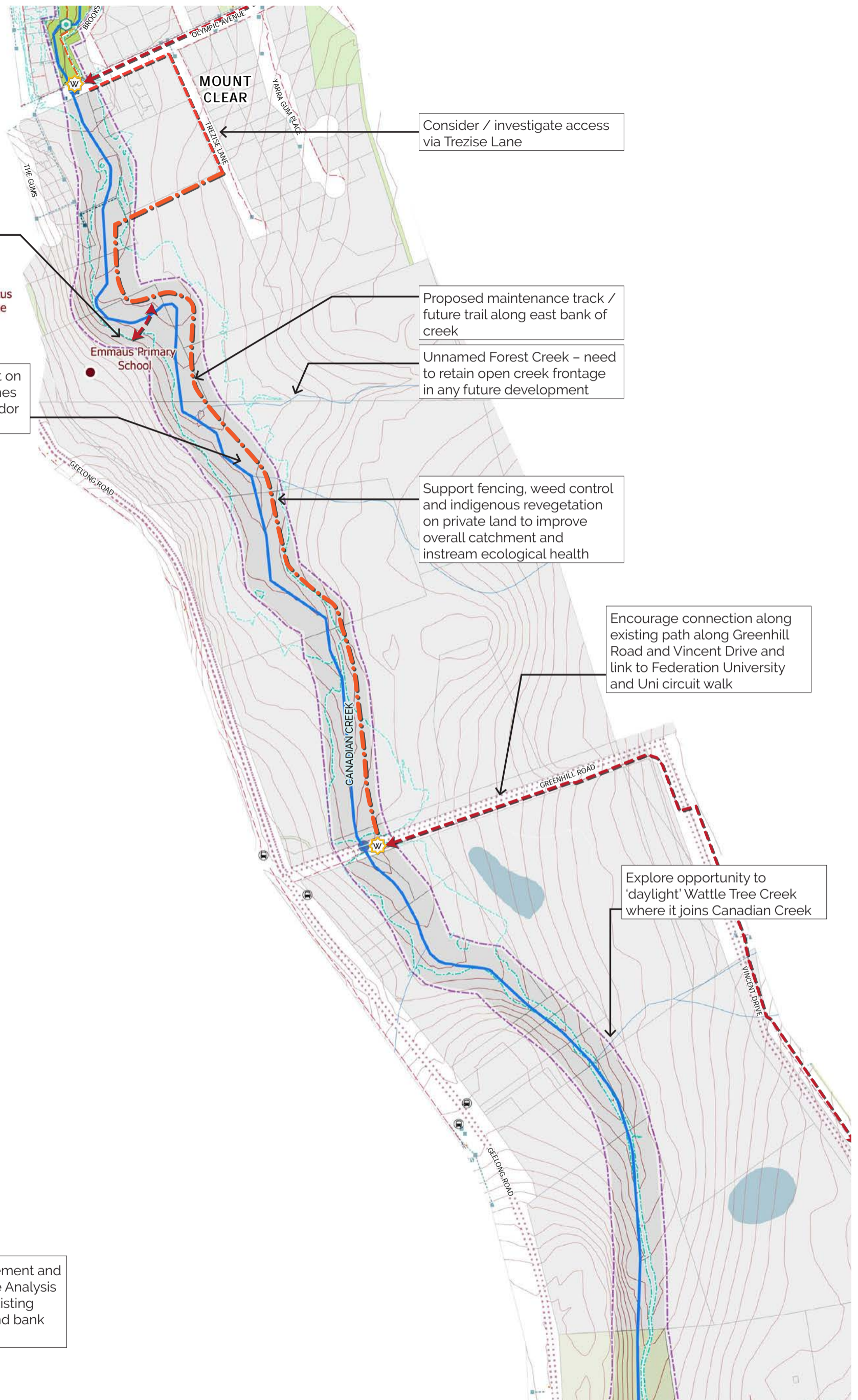




# Canadian Creek Masterplan

Scale 1:5000 at A3





Possible future link connection to across creek to Emmaus Catholic Primary School, on private land

Damascus College

Ensure future development on both side of creek establishes generous open space corridor adjoining the creek

GEE LONG ROAD

CANADIAN CREEK

MOUNT CLEAR

TREZISE LANE

Consider / investigate access via Trezise Lane

Proposed maintenance track / future trail along east bank of creek

Unnamed Forest Creek - need to retain open creek frontage in any future development

Support fencing, weed control and indigenous revegetation on private land to improve overall catchment and instream ecological health

Encourage connection along existing path along Greenhill Road and Vincent Drive and link to Federation University and Uni circuit walk

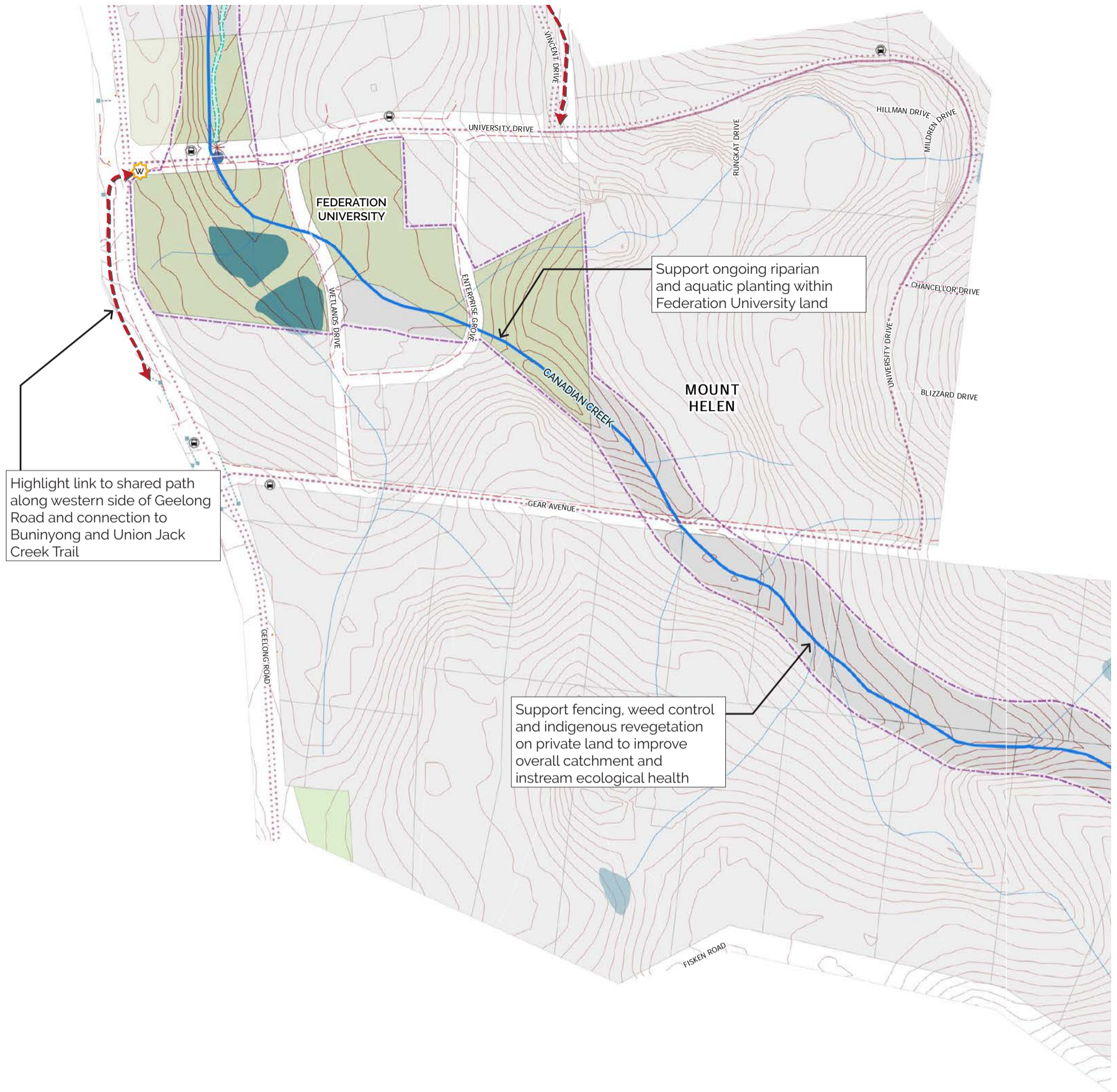
Explore opportunity to 'daylight' Wattle Tree Creek where it joins Canadian Creek

Note: Undertake weed management and erosion control as required. See Analysis plans in Report Appendix for existing areas of dense weed growth and bank erosion

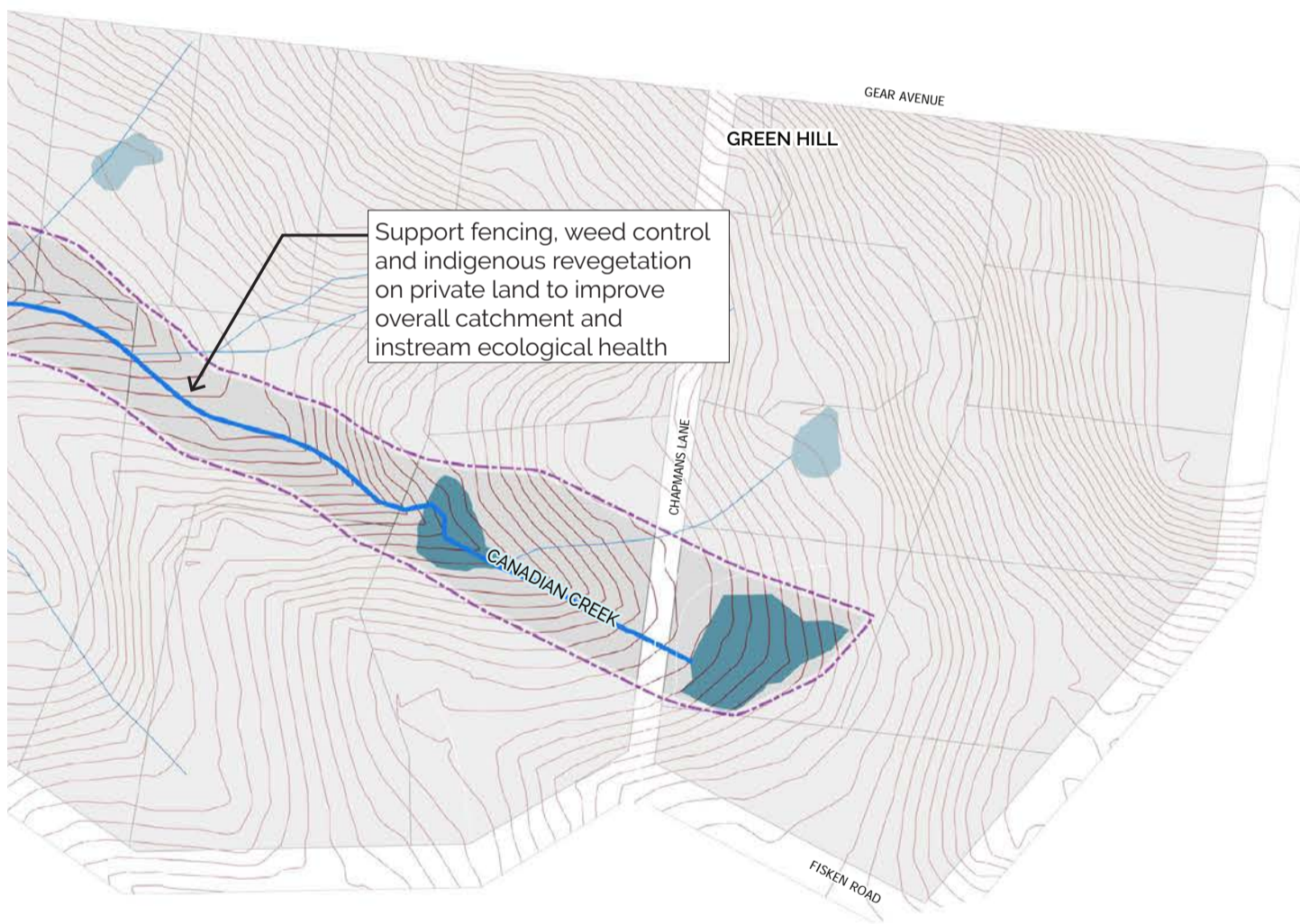
# Canadian Creek Masterplan

Scale 1:5000 at A3

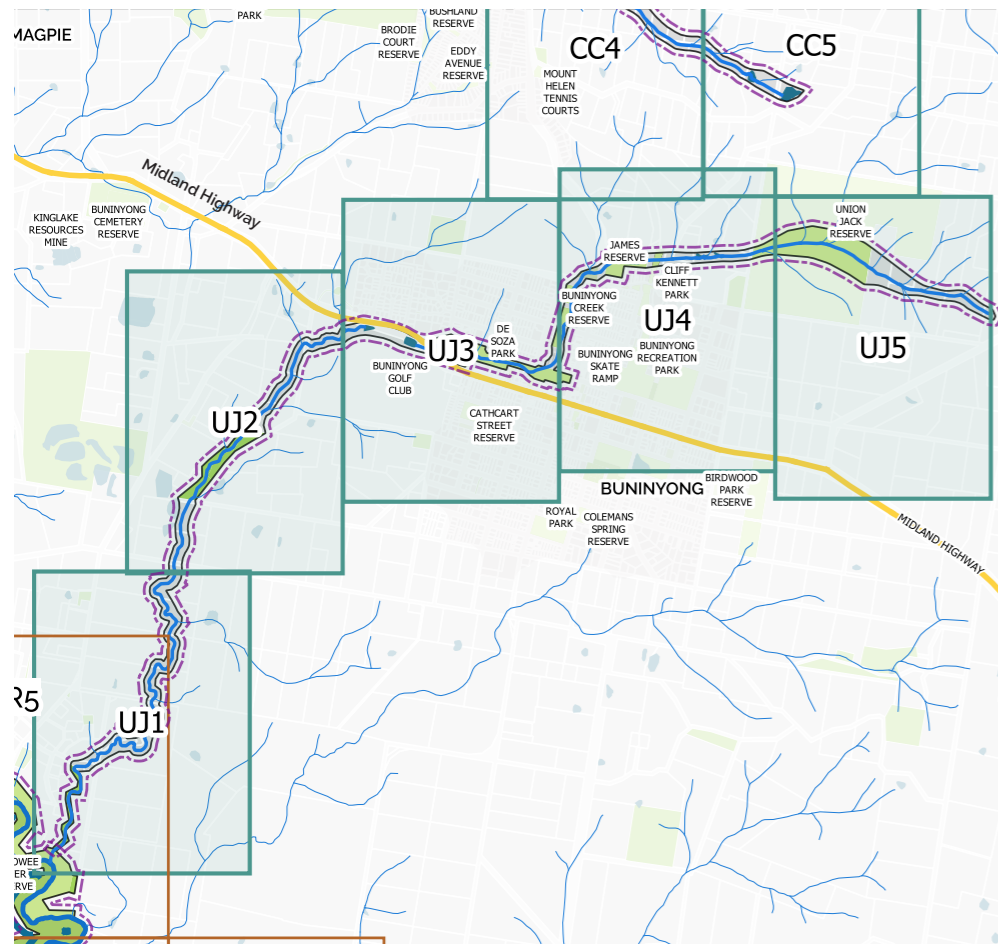




MOUNT  
HELEN



# Union Jack Creek



De Soza Park Trail



De Soza Park Trail

## Landscape character & general conditions

Union Jack Creek (previously known as Buninyong Creek) rises near the base of Mount Buninyong and flows through the township of Buninyong and Scotchmans Lead before joining the Yarrowee River.

The topography in the vicinity of the Union Jack Creek is undulating in the Buninyong area, becoming flatter downstream. There is a steep gully at the confluence with the Yarrowee River.

The EVC along Union Jack Creek is Valley Grassy Forest. Vegetation varies from areas of high quality indigenous vegetation, newly planted revegetation, to large weed infested areas. There are well developed trails along the creek corridor through the township of Buninyong.

There are several reserves along the Union Jack Creek including:

- Union Jack Reserve, managed by Parks Victoria, is a significant conservation reserve and historically a gold mining area
- De Soza Park, managed by City of Ballarat, is a linear reserve in the Buninyong town centre with excellent facilities and trails
- Several smaller reserves along the creek corridor in the township of Buninyong
- Buninyong Golf Course
- Crown land adjoining Macs Road / Somerville Road, Buninyong – local Landcare / community groups have undertaken weed control and revegetation works in this area
- Crown land between Sykes Road and confluence with Yarrowee River, Scotchmans Lead – the Napoleons Landcare Group have been actively working in this area, including good weed control and recent revegetation plantings



Steep Banks near Russell Street



Union Jack Creek Trail near Russell Street

Aside from the reserves mentioned, the remainder of the Union Jack Creek is on privately owned farm land.

## Assessment of the 1995 Masterplan

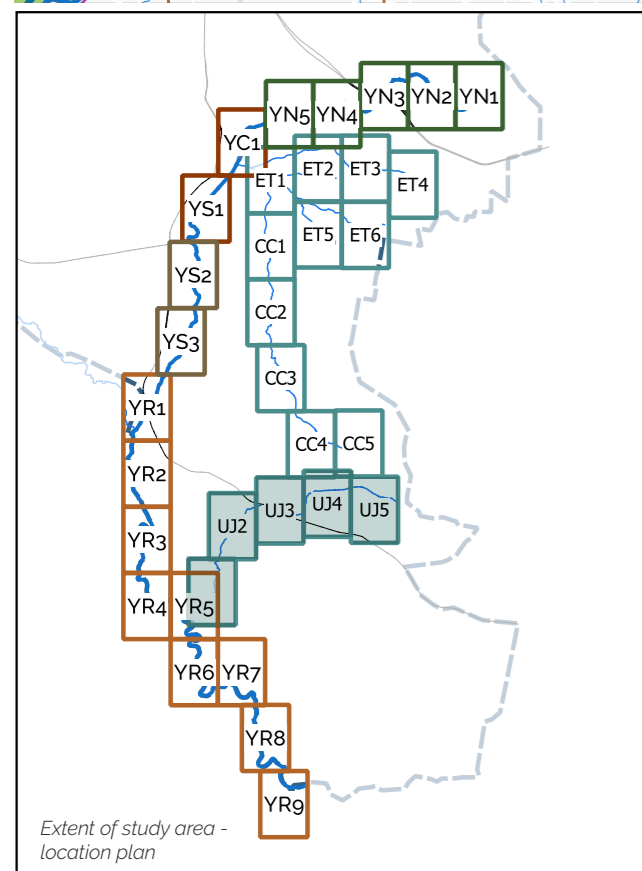
Canadian Creek is outside of the scope of the 1995 Masterplan.

## Overview of recommendations for the Union Jack Reach

The following is an overview of the recommendations for this reach. Refer to the plans and the detailed recommendations in the front of this report for more information.

The following improvements are recommended:

- Support local Landcare and community groups and land owners to undertake pest and weed control, erosion control and indigenous revegetation
- Stock proof farm fencing to property boundaries adjoining private land
- Improve instream vegetation within Buninyong township
- Develop trails within Buninyong township
- Develop a loop trail at the confluence with Yarrowee River
- Possible larger loop trails (i.e. linking Buninyong to Canadian Creek trail to the north and Yarrowee River to the south)
- Opportunity to develop creek corridor reserve if farm land is rezoned / subdivided



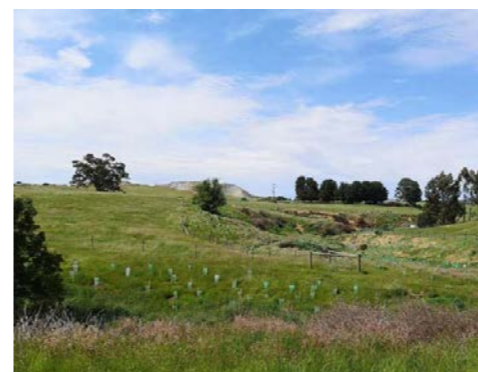
Trail path connected to Geelong Road



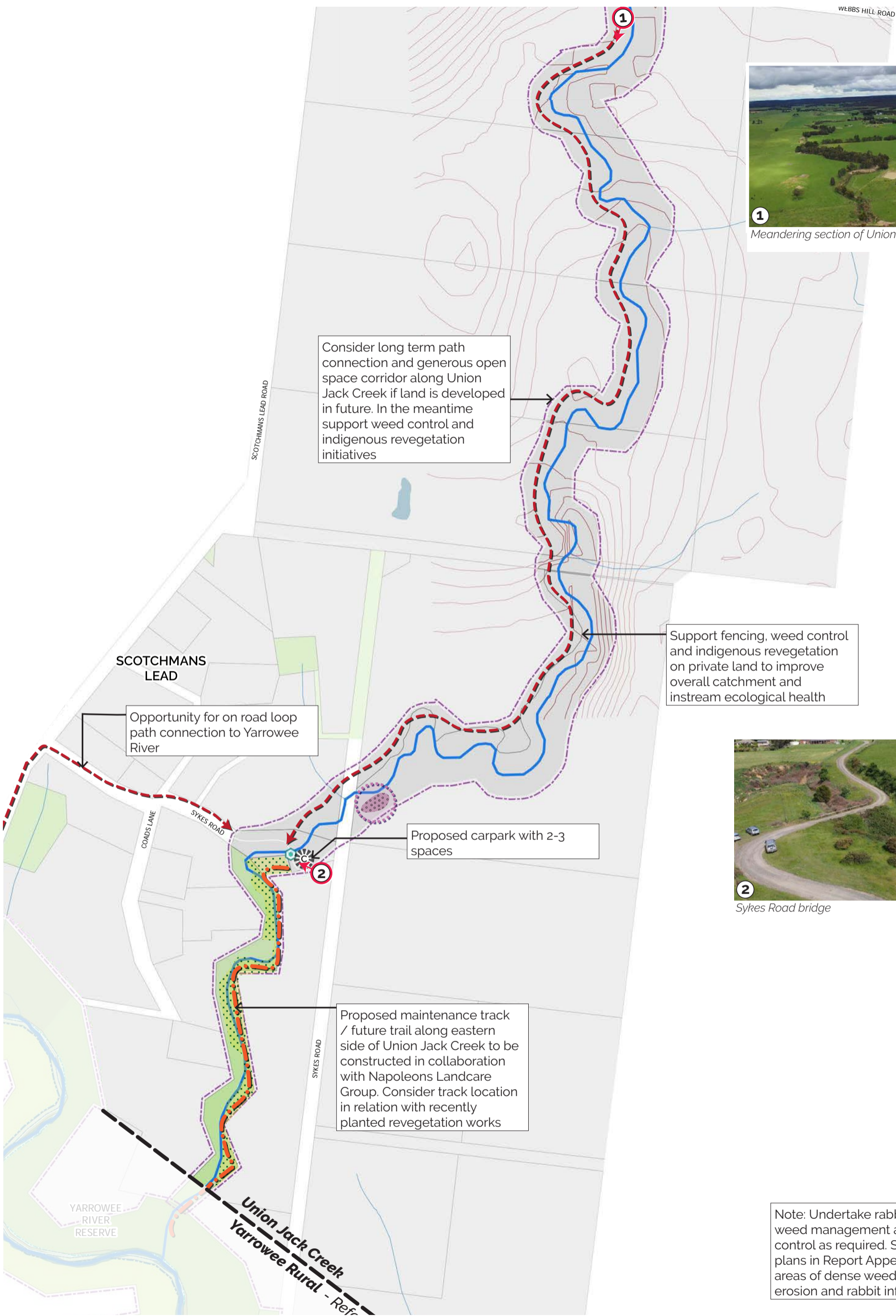
Eureka Track along Geelong Road



Henderson Lane Bridge and bushland



Sykes Road revegetation



1 Meandering section of Union Jack Creek



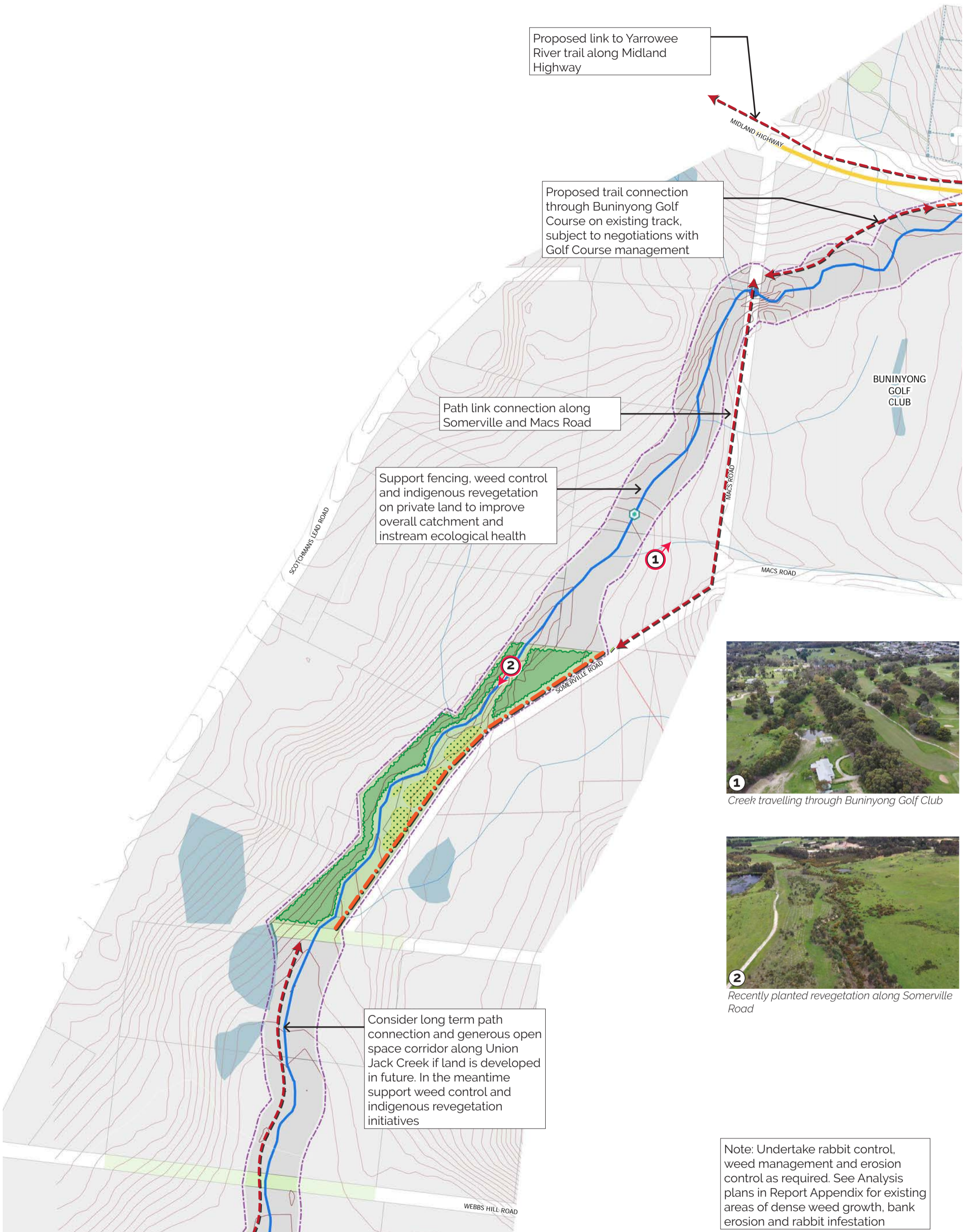
2 Sykes Road bridge

Note: Undertake rabbit control, weed management and erosion control as required. See Analysis plans in Report Appendix for existing areas of dense weed growth, bank erosion and rabbit infestation

# Union Jack Creek Masterplan

Scale 1:5000 at A3





1 Creek travelling through Buninyong Golf Club



2 Recently planted revegetation along Somerville Road

Note: Undertake rabbit control, weed management and erosion control as required. See Analysis plans in Report Appendix for existing areas of dense weed growth, bank erosion and rabbit infestation

# Union Jack Creek Masterplan

Scale 1:5000 at A3







**Union Jack Creek**  
Masterplan

 Scale 1:5000 at A3





# Union Jack Creek Masterplan

Scale 1:5000 at A3





# Union Jack Creek

## Masterplan

Scale 1:5000 at A3

