



DRAFT

MOORABOOL RIVER
RESERVE
MASTERPLAN

ACKNOWLEDGEMENT OF COUNTRY

Golden Plains Shire spans the Traditional lands of the Wadawurrung and Eastern Maar people. We Acknowledge them as the Traditional Owners and Custodians.

Council pays its respects to Wadawurrung Elders past, present and emerging. Council also respects Eastern Maar Elders past, present and emerging.

Council extends that respect to all Aboriginal and Torres Strait Islander People who are part of the Golden Plains Shire.

Artwork: by Shu Brown



This Masterplan report has been prepared for the Golden Plains Shire Council by:

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RMCG

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Council acknowledges the Wadawurrung people as the Traditional Owners of the Country on which this project has been conducted. We recognise their continuing connection to land, waters and culture and pay our respects to their Elders past and present. Moreover, Council expresses gratitude for the knowledge and insight that Traditional Owners and other Aboriginal and Torres Strait Islander people contribute to our shared work in Australia.

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Executive Summary

PROJECT CONTEXT

The *Moorabool River Reserve Masterplan*'s strategic basis aligns with current Victorian Government policy direction for the protection and health of the Moorabool River (Murrabul or Moorobull Yulluk) under the Corangamite Waterway Strategy¹ and Rivers of the Barwon (Barre Warre Yulluk) Action Plan². It also responds to the recognised values of the project area, which result from complex interactions between landscape character, biodiversity and other natural values, existing and future settlement patterns, infrastructure, Wadawurrung living cultural heritage values and historic heritage. The Moorabool River Reserve is shown in Figure E-1.

MASTERPLAN VISION

The Moorabool River Reserve is a cornerstone of the Batesford open space network:

- valued for its protected and peaceful landscape, history, biodiversity and natural floodplain values;
- a place where its Wadawurrung values are protected and cultural connections past and present are understood and respected; and
- a safe, well-connected space for the community to access and enjoy.

KEY GOALS

To realise this vision, the goals for the reserve are to:

- Protect and improve awareness and appreciation of Wadawurrung values and cultural practices.
- Protect and restore biodiversity and habitat values using shared Wadawurrung knowledge and practices to inform land and water management actions.
- Improve awareness and links to Batesford's historic heritage while continuing staged restoration of the indigenous floodplain riparian woodland ecology.
- Improve public access and provision of passive recreation facilities where in harmony with floodplain environmental and cultural values.
- Ensure infrastructure is designed to climate resilient standards to withstand the impact of increasing flood and bushfire risk while respecting Wadawurrung values and protecting the natural landscape character.

OVERALL OBJECTIVES

The following overall objectives apply to the whole reserve:

- Improve awareness, understanding and appreciation of Wadawurrung values and culture
- Improve walking and maintenance vehicle access.
- Manage visitor impacts to minimise impacts on flora, fauna and other reserve visitors.
- Provide information/interpretation to improve visitor understanding and appreciation of the cultural, historic and natural values of the reserve.
- Restore and improve biodiversity across the reserve through revegetation with local indigenous species.
- Provide climate resilient visitor infrastructure while minimising impacts on flora and fauna and the floodplain.

¹ CCMA, 2014.

² DELWP, 2021.

- Provide appropriate reserve zoning under the Golden Plains Shire planning scheme
- Manage declared weeds and established pest animals and environmental weeds to minimise impacts on flora, fauna and reserve visitors.
- Minimise risk to reserve users.



Figure E-1: Moorabool River Reserve.

1 Introduction

1.1 PURPOSE OF THIS PLAN

The purpose of this Masterplan is to:

1. Facilitate an extensive engagement process with the Golden Plains Shire, Batesford community, and key stakeholders including City of Greater Geelong and Corangamite Catchment Management Authority (CMA) to identify priorities for the future management of the Moorabool River Reserve north of Batesford.
2. Develop a strategic blueprint that defines the long-term vision, strategic objectives and actions for the reserve based on both the outcomes of the community and stakeholder consultation, and consideration of broader policy objectives for the area through:
 - the larger Kitjarra-dja-bul Bullarto langi-ut Masterplan project,
 - the *Paleert Tjaara Dja* – the Wadawurrung Healthy Country Plan,
 - future growth area pressures on the site through the neighbouring Geelong West Growth Area; and
 - relevant Golden Plain Shire strategies and policies.
3. Provide staged recommendations for future management of the reserve.

More specifically, the plan addresses the following issues and opportunities:

- Long term protection and restoration of Moorabool River Reserve, its floodplain and environmental values
- Ensuring public safety and sustainable management of infrastructure in areas subject to frequent flooding and potential fire risk
- Protection of Traditional Owner values and cultural connections past and present and direct involvement in the management of these values
- Protection of historic heritage values associated with the early establishment of the Batesford area and railway
- Improving community access, use and enjoyment of the reserve through sustainable open space design and management
- Protecting the landscape character and amenity of the reserve
- Improving community awareness of cultural and environmental values.

The plan also recommends management practices to protect the values of the project area and assist in responding to the impacts of future flood events as much of the reserve is subject to deep and frequent flooding.

1.2 MASTERPLAN VISION

The Moorabool River Reserve is a cornerstone of the Batesford open space network:

- valued for its protected and peaceful landscape, history, biodiversity and natural floodplain values;
- a place where its Wadawurrung values are protected and cultural connections past and present are understood and respected; and
- a safe well-connected space for the community to access and enjoy.

1.3 MASTERPLAN STRUCTURE

This Masterplan is divided between two sections:

- **Part A: Background** – this section details the site’s characteristics and values, engagement feedback, and management issues
- **Part B: Masterplan** – this section outlines the proposed management objectives and actions for implementation.

PART A: BACKGROUND



2 Site Context

2.1 STUDY AREA

The reserve is located within the lower Moorabool River catchment on the boundary of the Golden Plains Shire, immediately north of the Batesford township and the Midland Highway (Figure 2-1).

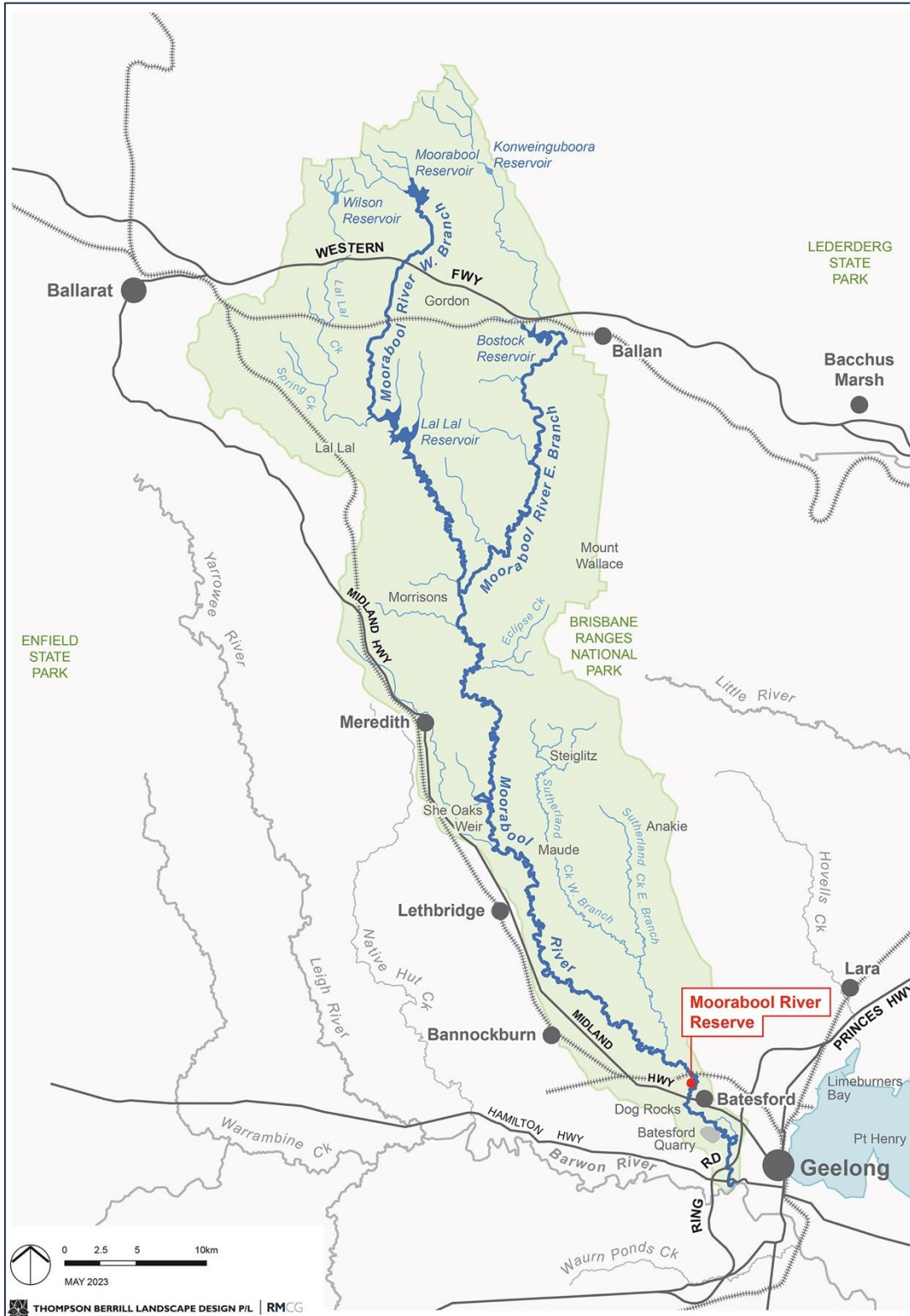


Figure 2-1: Overall catchment context.

The extent of the project area (shown in Figure 2-2 below) has approximately 2.8 kilometres of frontage to the west of the Moorabool River.

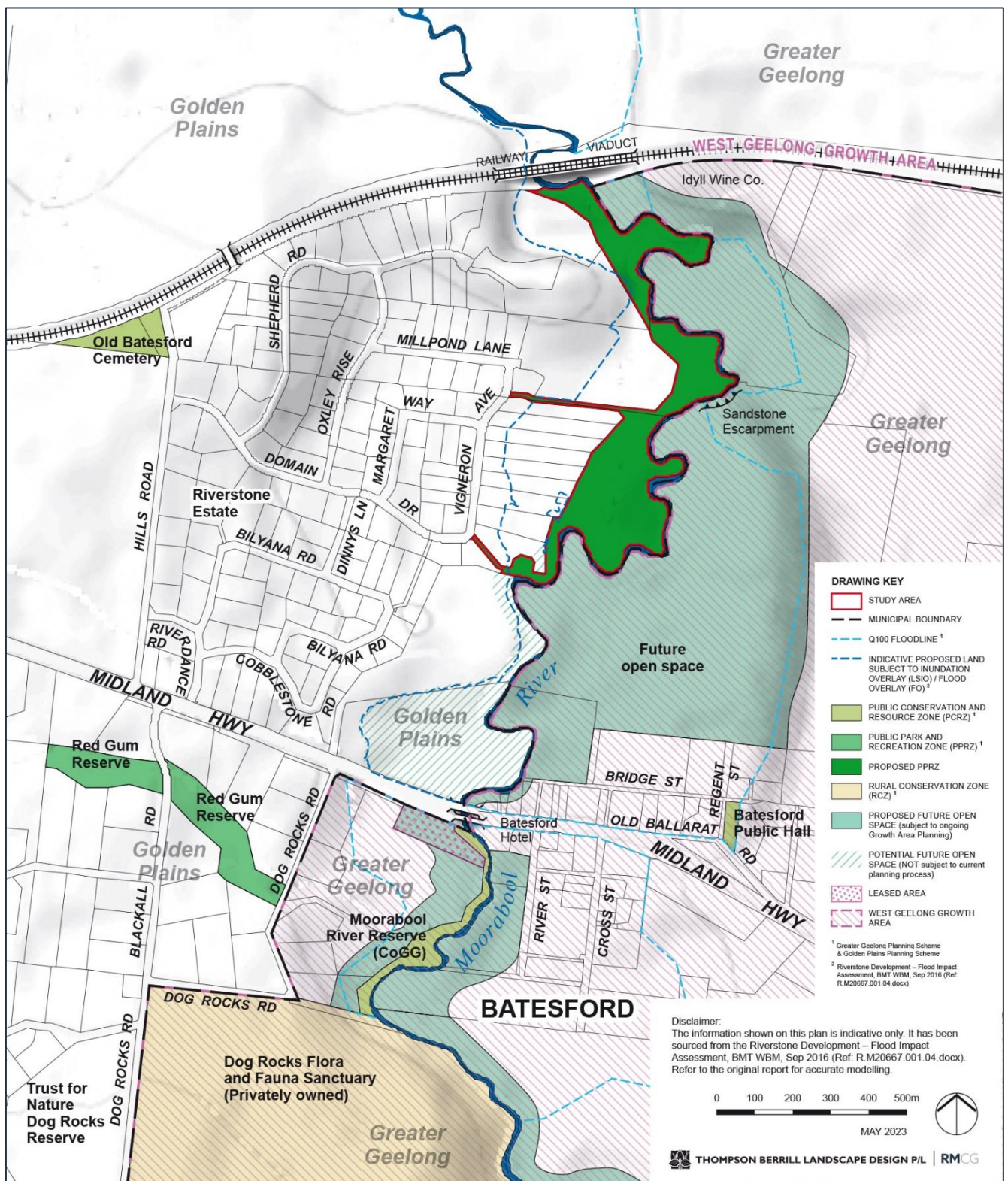


Figure 2-2: Local site context.

2.2 LAND OWNERSHIP AND MANAGEMENT

The approximately 17-hectare Moorabool River Reserve has recently been transferred to the Golden Plains Shire Council (GPSC) as public open space as part of the adjoining Riverstone development at Batesford. The site is comprised of the following freehold titles held by GPSC:

- Lot RES1 PS740217 (4.4ha)
- Lot RES1 PS826440 (3.4ha)
- Lot RES2 PS826441 (9.02ha).

The reserve adjoins approximately 2.8 kilometres of crown land frontage to the Moorabool River to the east. The river itself is contained within unreserved Crown land designated as Crown Water Frontage (CA 2016, Parish of Gheringhap) under the direct management of the Department of Energy, Environment and Climate Action (DEECA).

The reserve is bordered to the west by a series of rural residential allotments as part of the Riverstone Estate and adjoins Vigner Avenue (a Council road reserve). The reserve is bounded to north by land managed by VicTrack that forms part of the Ballarat – Geelong railway and the historic Railway Viaduct.

2.3 STRATEGIC CONTEXT

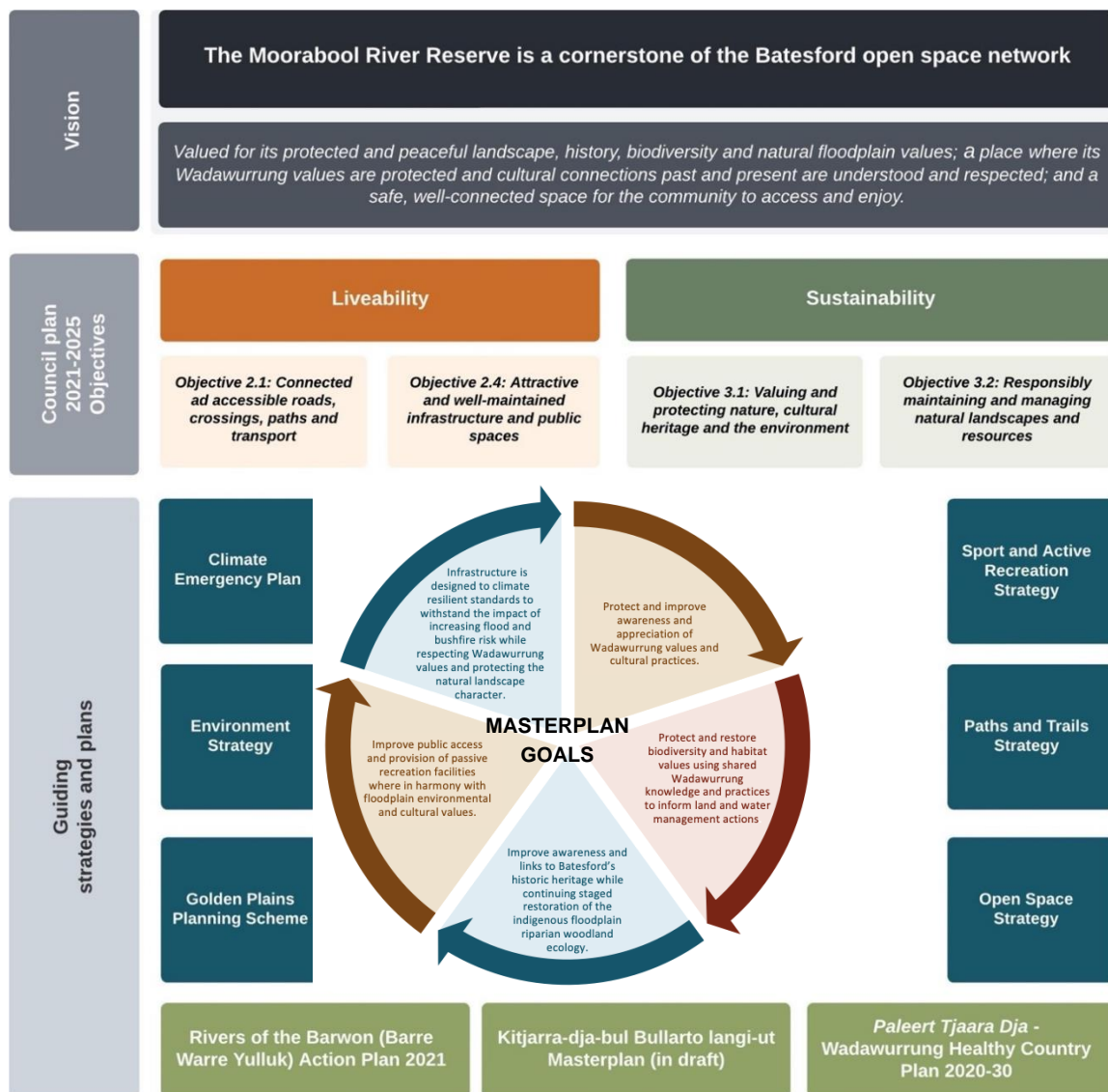


Figure 2-3: Strategic framework.

Management of the reserve is carried out under the direction of the following legislation:

Commonwealth

- *Environment Protection and Biodiversity Conservation Act (1999)*
- *Native Title Act (1993)*

Victoria

- *Aboriginal Heritage Act (2006)*
- *Catchment and Land Protection Act (1994)*
- *Fences Act (1968)*
- *Flora and Fauna Guarantee Act (1988)*
- *Heritage Act (1995)*
- *Land Act (1958)*
- *Local Government Act (2020)*
- *Planning and Environment Act (1987)*
- *Water Act (1989).*

Management of the reserve is carried out under the guidance of the following broader strategies and plans:

- Barwon Strategic Directions Statement (Integrated Water Management) 2022 (DELWP, 2022)
- Central and Gippsland Region Sustainable Water Strategy (DELWP, 2022)
- Corangamite Floodplain Management Strategy 2018-2028 (Corangamite CMA, 2018)
- Corangamite Waterway Strategy 2014-2022 (Corangamite CMA, 2014)
- Corangamite Regional Catchment Strategy 2021-2027 (Corangamite CMA, 2021)
- Discover the Living Moorabool '*Flagship Waterway*' project (Corangamite CMA)
- Kitjarra-dja-bul Bullarto langi-ut Masterplan (Corangamite CMA, in development)
- Northern and Western Geelong Growth Areas Framework Plan (City of Greater Geelong, 2019)
- *Paleert Tjaara Dja* - Wadawurrung Healthy Country Plan 2020-30
- Protecting Victoria's Environment - Biodiversity 2037 (DELWP, 2017)
- Rivers of the Barwon (Barre Warre Yulluk) Action Plan 2021 (DELWP, 2021)
- Victorian Floodplain Management Strategy 2016 (DELWP, 2016)
- Victorian Waterway Management Strategy 2013 (DELWP, 2013)
- Water for Victoria - Water Plan 2015 (DELWP, 2015).

Management of the reserve is also carried under the direction of the following Council strategies and plans:

- Climate Emergency Plan 2022-2032
- Council Plan 2021-2025
- Draft Tree Protection and Management Policy
- Environment Strategy 2019 – 2027
- Golden Plains Planning Scheme (refer below)
- Municipal Public Health and Wellbeing Action Plan 2021 – 2025
- Open Space Strategy 2013 – 2017
- Paths and Trails Strategy 2013 – 2017
- Reconciliation Action Plan (June 2022-December 2023)
- Sport and Active Recreation Strategy 2020 – 2030.

These strategies and plans have informed the development of this Moorabool River Reserve Masterplan.

2.4 ZONING AND OVERLAYS

ZONING

The Moorabool River Reserve is currently zoned as Low Density Residential Zone (LDRZ) under the Golden Plains Planning Scheme. The Masterplan vision is to transform the area into a publicly accessible space and a conservation reserve. This change of use will need a Planning Scheme Amendment to rezone the area to Public Park and Recreation Zone (PPRZ).

The surrounding lots to the west in the Riverstone Estate will remain in the LDRZ to provide for low-density residential development on lots which, in the absence of reticulated sewerage, are expected to treat and retain all wastewater.

ENVIRONMENTAL SIGNIFICANCE OVERLAY

The entire Moorabool River Reserve is subject to Schedule 3 of the Environmental Significance Overlay (ESO3), which is aimed at both:

- identifying areas where the development of land may be affected by environmental constraints.
- ensuring that development is compatible with identified environmental values.

The area subject to ESO3 contains environmental attributes which vary from remnant vegetation, unspoiled habitats, scientific importance, natural beauty, natural heritage and unique geological formations.

The environmental objectives to be achieved under the ESO3 are:

- To protect the conservation values of the above areas.
- To protect natural environmental processes, maintain biodiversity and protect natural resources of soil, water, flora and fauna.
- To protect habitat for fauna.
- To protect geological formations and landscape values.
- To protect significant vegetation, protect wetland habitat for fauna, and protect geologically significant features.

These objectives have informed the development of this Moorabool River Reserve Masterplan.

SIGNIFICANT LANDSCAPE OVERLAY

The entire Moorabool River Reserve is subject to recently adopted Schedule 18 of the Significant Landscape Overlay (SLO18), which is aimed at both:

- identifying significant landscapes
- conserving and enhancing the character of significant landscapes.

SLO18, which was adopted on 16 December 2022, is aimed at the Rivers of the Barwon: Moorabool River (Moorabool) Corridor Environs of which the Moorabool River Reserve forms a part. It includes the following statement of nature and key elements of landscape relevant to the Moorabool:

'The Moorabool River (Moorabool) forms part of the connected system of rivers within the Barwon (Barre Warre Yulluk) catchment. The river has intrinsic spiritual connections and living cultural heritage significance to Wadawurrung Traditional Owners and is of high natural and landscape value.'

Due to the topography and landscape of the river, bushfire is a present risk in some locations along the corridor.

The main reach of the Moorabool River commences at the confluence of the river's East and West branches at Morrisons and flows through Meredith, She Oaks, Maude, Lethbridge and Batesford, before joining the Barwon River (Parwan) at Fyansford.

The significant landscape of the Moorabool River is defined by its course which winds through a valley of undulating hills and gorges with steep escarpments. These escarpments protect bands of remnant vegetation, provide important habitat corridors, and reinforce the green spine through the wider landscape. The landscape of the Moorabool River corridor is generally one of a rural and agricultural environment where most native vegetation has been cleared, leaving visually open and sparsely vegetated vistas. Within this setting, the riparian corridor forms a green spine through the landscape providing important habitat for threatened species like the Platypus, (Wad-dirring/Perridak), Tussock Skink and Macquarie Perch.'

In the middle reaches of the Moorabool River at Meredith there are examples of Grassy Forest which provide an enclosed and vegetated landscape setting. Dog Rocks Sanctuary at Batesford also provides important Shrubland and Floodplain Riparian Woodland flanking the river corridor.'

The landscape character objectives to be achieved under the SLO18 are:

- To enhance the continuous riparian corridor landscape.
- To retain indigenous riparian vegetation and canopy trees as a dominant landscape feature, ensuring it responds to the bushfire risk of a location.
- To ensure buildings and works are not visually dominant when viewed from the waterway corridor.
- To encourage buildings and works to be set back from the banks of the river to avoid overshadowing and visual intrusion within the landscape and maintain an open waterway corridor.
- To ensure the location and size of earthworks minimises alterations to natural drainage and is consistent with the landscape character.

These objectives have informed the development of this Moorabool River Reserve Masterplan.

OTHER OVERLAYS

The area is also subject to schedule 5 of the Design and Development Overlay (DDO5) and schedule 11 of the Development Plan Overlay (DPO11) to ensure the siting and design of buildings in the area creates an attractive low density residential environment, has regard to the low density residential character of the area and ensures that a high level of amenity is maintained in low density residential areas. The Moorabool River Reserve is also subject to both the Flood Overlay (FO) and the Land Subject to Inundation Overlay (LSIO) (Refer to Sections 6.1 and 6.2).

3 Community engagement

As a foundation to shape the development of this Masterplan, the Batesford and broader community were encouraged to contribute their views through an online survey and through a series of engagement events.

The consultation period for the survey was open for six weeks between 28 November 2022 and 9 January 2023, and the survey consisted of eight questions across the spectrum of what respondent's value about use of the reserve, key issues, and opportunities. There was also an evening community meeting at the Batesford Hall on 13 December 2022 and a Saturday site walkover on 17 December 2022.

In total there were 46 responses to the survey, including 38 online responses and eight written responses.

3.1 WHAT WE HEARD?

Community members were asked about what they use the reserve for, what are the priority issues and to think about how they wanted to see the reserve managed in the future. A sample of the key survey findings are included below. Please note that many respondents provided multiple answers to each survey question.

ACTIVITIES AND USE

Community members were asked to consider how they currently used the reserve. For those who did use the reserve, the survey found that most users of reserve do so for walking (36 responses), walking the dog (12 responses) and bird watching or observing wildlife (ten responses). Other key uses included a place for the family to meet and for children to play in an unstructured space (ten responses), nature appreciation and relaxation (eight responses) and bike riding (five responses). Fishing and picnics were also cited as uses of the reserve by a small number of respondents.

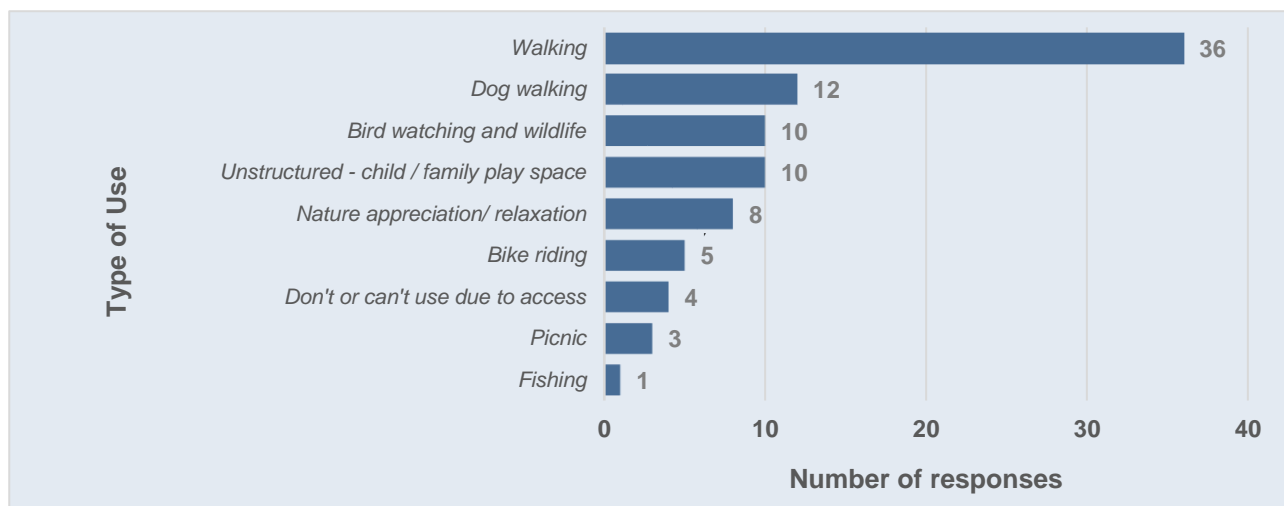


Figure 3-1: What the reserve is currently used for by respondents

PRIORITY ISSUES

Community members were asked to consider what they saw as the highest priority issues to be addressed in the reserve. The survey found that the most cited priority issue was biodiversity / nature protection (19 responses), followed by new or enhanced walking tracks (ten responses) and grounds maintenance or lawn mowing (ten responses). Other key priority issues included weed management (eight responses), leaving as is or no or minimal development (seven responses), protection of sensitive areas (five responses) and revegetation or biodiversity enhancement (five responses). Cultural and historic heritage protection and awareness, education and interpretive signage, and bike paths were also cited by a number of respondents.

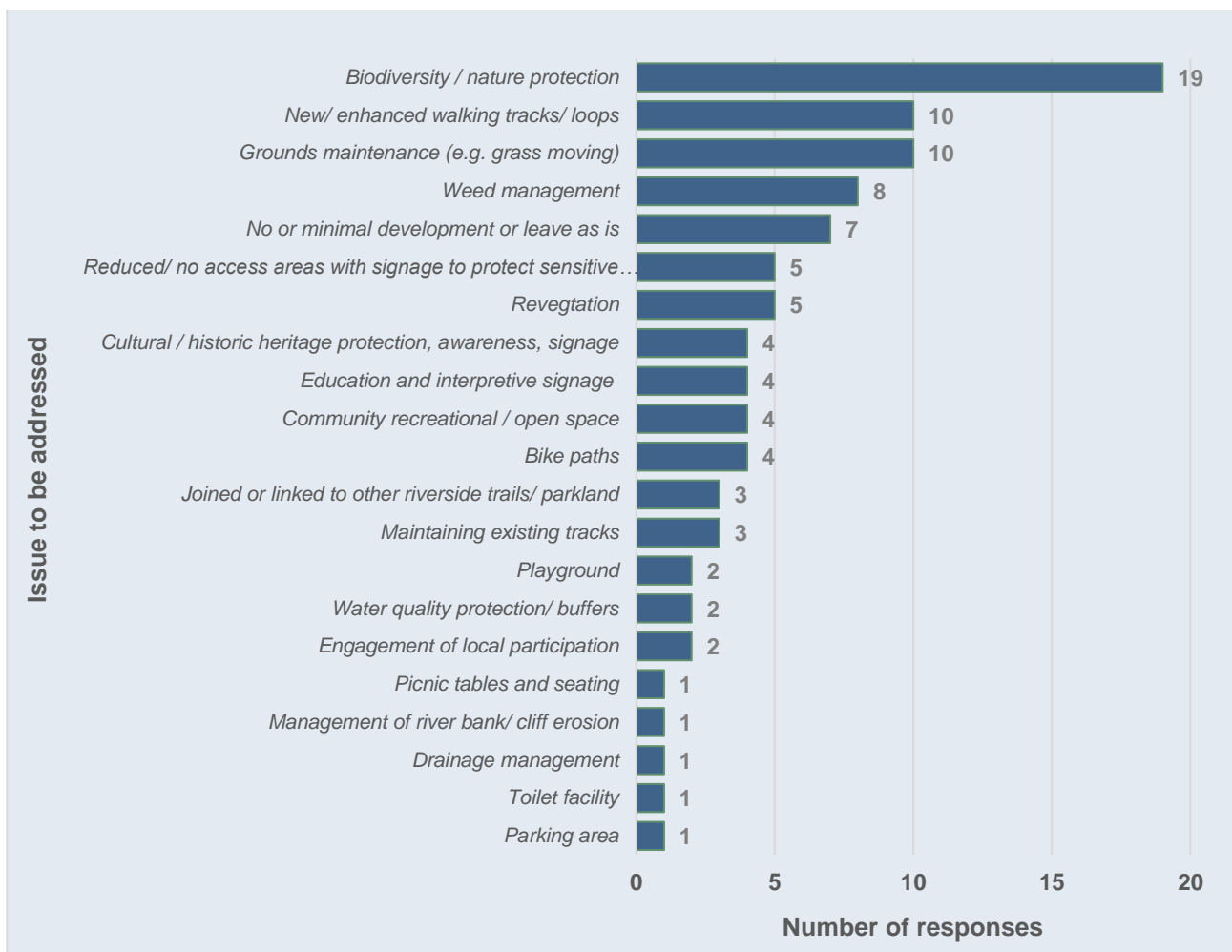


Figure 3-2: Highest priority issues raised by respondents to be addressed.

The key issues raised by respondents have also been captured in a word cloud diagram as detailed in Figure 3-3 below.



Figure 3-3: Word cloud diagram of high priority issues raised by respondents

Community members were asked to think about what they wanted to see developed in the reserve.

A diverse sample of some of the responses are highlighted below:

- "Information on indigenous significance"
- "Access points to river for paddling. Connection to the other side of the river (pedestrian bridge)"
- "Small parking area with an adventure all-ability playground. A covered BBQ area with seating and toilets - a space for the community to meet. Meandering paths of gravel/dirt with strategic placed seating. Signage about the historical Aboriginal and European use of the land and about the land itself. Bins for dog poop and litter but signage encouraging users to leave no trace and take their rubbish and dog poop home".
- "As far as possible left as is with continued environmental management where necessary. Subtle and appropriate signage about the flora and fauna and history of this area both educative and directional in order highlight the character of the area and indicate some walking tracks, and any dangers, e.g. snakes."
- "Walking paths. Picnic areas with small scale shelters to provide protection for users during inclement weather. Interpretive signage on cultural heritage and the environment. Rest areas (seats) and observation stations. Pedestrian/cycle path linkage to old Batesford and the south side (future) of the highway."

[illegible]

The community was also asked what recreational pursuits they would like to see allowed in the reserve. The survey found that the most cited recreational opportunity to be allowed in the reserve (over half of the

respondents) was walking (31 responses), followed by dogs on leads (20 responses), fishing (14 responses), bike riding (14 responses), canoeing and kayaking (paddle sports) (nine responses) and dogs off leads (or dogs off leads access) (six responses). Picnics, bird watching and nature appreciation and community and family gatherings were also cited by a number of respondents.

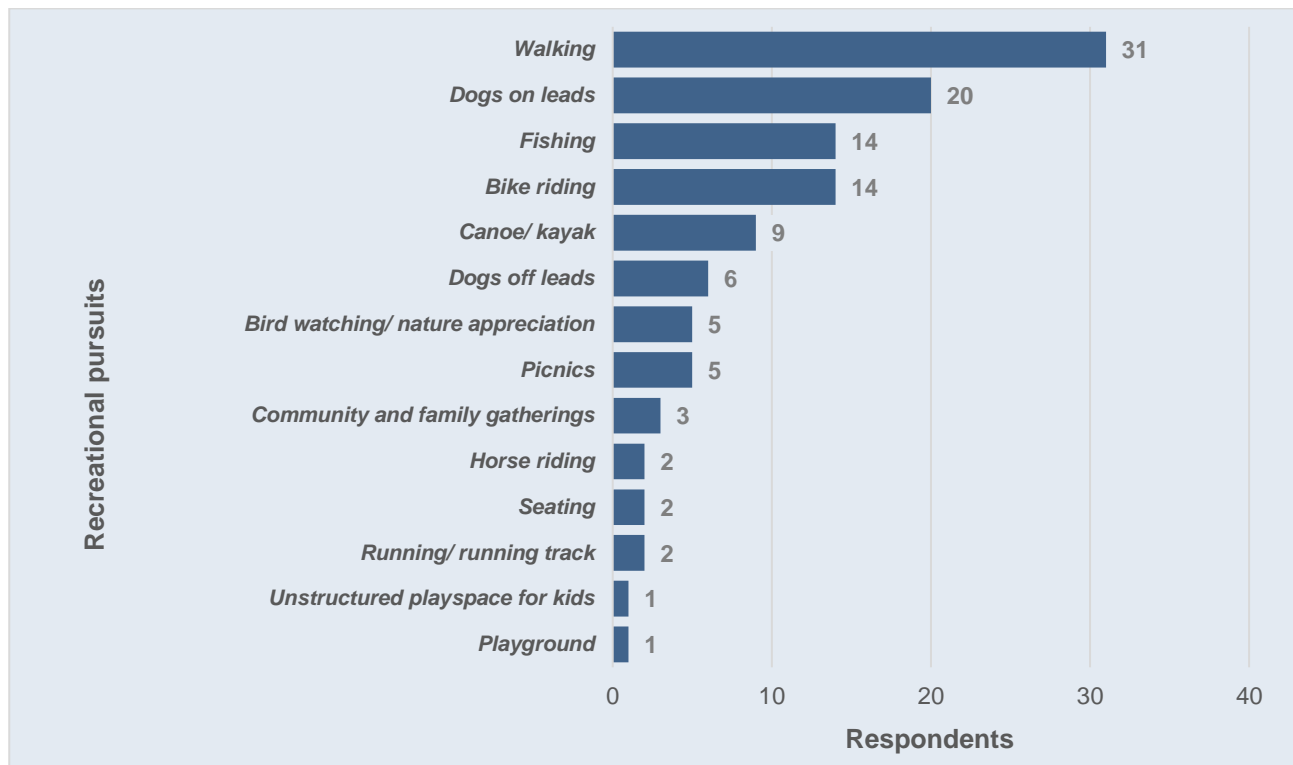


Figure 3-5: Recreational opportunities identified by respondents to be provided for in the reserve.

These responses have also been captured in a word cloud diagram in Figure 3-6 below.



Figure 3-6: Recreational pursuits that respondents identified should be allowed in the reserve.

4 Cultural Values

4.1 KNOWN ABORIGINAL CULTURAL HERITAGE PLACES

The Wadawurrung people (represented by Wadawurrung Traditional Owners Aboriginal Corporation (WTOAC)) have been caring for Country in the lower Moorabool since time immemorial, and the rivers of the Barwon (including the Moorabool) hold special significance and meaning for the Wadawurrung people, including Songlines, Story Places, and Secret and Sacred Places.

The name Moorabool is derived from the Wadawurrung word Murrabul, meaning freshwater mussel. Given this connection to Country, the Moorabool catchment is rich in cultural significance, and areas of cultural heritage sensitivity that are known to contain, or likely to contain Aboriginal cultural heritage places and objects and have been defined in the Aboriginal Heritage Regulations (2018) and have been identified and mapped for the project site (refer Figure 4-1). Importantly, this mapping is indicative only and may not represent the true geographic extent as defined in the Regulations. It is also important to note that Aboriginal cultural heritage can be found all across Victoria. Thousands of generations of Aboriginal people have lived throughout Victoria and Aboriginal places and objects are located in even the most intensively developed regions.

A search of the Aboriginal Cultural Heritage Register (ACHRIS) was undertaken on 8 March 2023 and identified five previously recorded Aboriginal Places including four artefact scatters, and one scarred tree. The context of these Places is discussed below (Table 4-1).

The density of the identified places is directly affected by previous studies and cultural heritage management plans undertaken within the study area.

Due to the relatively undisturbed nature of much of the reserve, the intrinsic sensitivity of the waterway, and the lack of previous testing undertaken it is considered highly likely that *in situ* Aboriginal Places are present within the reserve.

Lithic (stone) artefacts are the most probable artefact type to be encountered in this region, however there is also a high likelihood of previously unidentified scarred trees in locations where mature native trees remain. Due to past farming activities intact mounds or cooking hearths (the remains of old fire pits) are less likely to be present within this area, however flattened remnants are possible.

Table 4-1: Aboriginal Place Context

PLACE TYPE	NUMBER	CONTEXT
Artefact Scatters	4	Artefact scatters are stone artefact distributions consisting for greater than 10 components within a 10m ² area. These are also most commonly located within proximity to waterways, though they may be identified anywhere within the study area.
Scarred Trees	1	<p>Aboriginal people caused scars on trees by removing bark for various purposes. The scars, which vary in size, expose the sapwood on the trunk or branch of a tree. The removed bark was used to make canoes, containers, shields, or shelters.</p> <p>These Places are typically found in close proximity to water sources in areas where mature native trees are present. Tree species typical of bearing cultural scars are River Red Gum, Stringy Bark, Black Box, and Grey Box.</p>

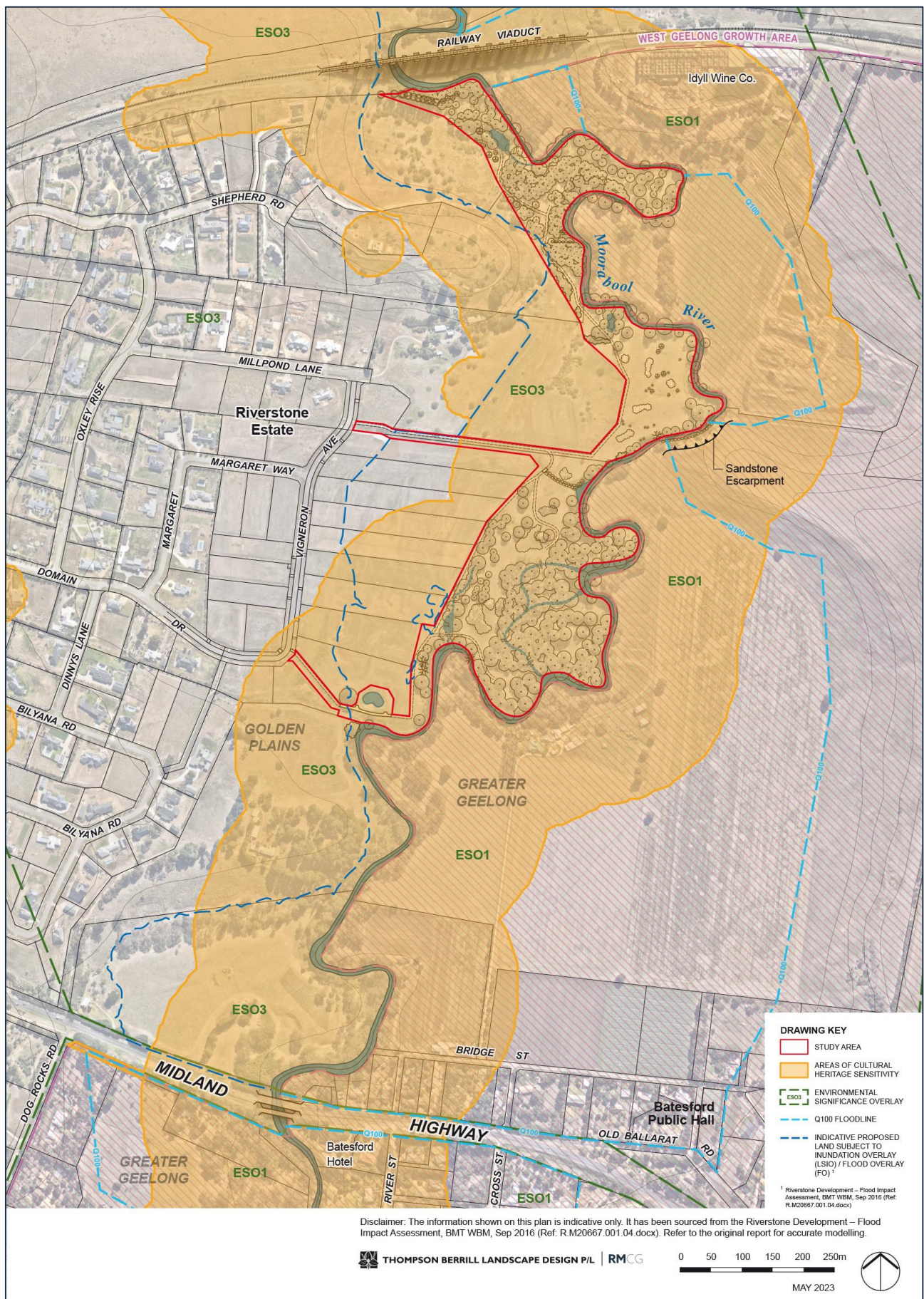


Figure 4-1: Areas of cultural heritage sensitivity.

4.2 INTANGIBLE ABORIGINAL CULTURAL HERITAGE

In addition to the physical and tangible Aboriginal Heritage Places previously identified within the activity area, there are also a considerable number of intangible and spiritual areas of importance to the Wadawurrung People within the study area.

According to the Wadawurrung, the coast, wetlands, grassy and volcanic plains of the Dja (Country) were formed by Bunjil the Eagle, the Ancestor Creator.

The livelihood and culture of the Wadawurrung people is inextricably linked to the biodiversity of the Moorabool Catchment and broader Barwon Basin region. The inland plains, waterways, coastal and sea (warre) Country provided rich resources that sustained the Wadawurrung people for thousands of generations. The native plants and animals provided food, clothing, shelter and medicine for the Traditional People.

“Most of the large animals, including Go-yin (wallabies), Goim (kangaroos), Walert (possums), ducks and swans were hunted and processed by men using boomerangs and spears. Buniya (eels) were caught in eel traps and water birds were caught in nets that our women wove and made from plant fibres, a practice we continue today. The sea provides bountiful sources of crayfish, abalone, mussels, oysters, pipis and fish”

~ Wadawurrung Traditional Owners³



Figure 4-2: Walk on Country with Wadawurrung Traditional Owners⁴

Protecting biodiversity along the Barwon and Moorabool rivers will also serve to protect connection to traditional Wadawurrung culture, through the preservation of important totem species, bush foods and

³ WTOAC, 2020.

⁴ Photo: T. Wallis, RMCG, 2023.

medicines and supporting traditional practices to continue on Country. Similarly, as Native Title is resolved across the state, the involvement of Traditional Owners in the management of the public land estate is being restored. This provides an opportunity for the Wadawurrung to apply their knowledge and skills in managing and conserving the region's natural environment and enables others to learn from them⁵.

WADAWURRUNG VALUES

The Wadawurrung people have identified nine values, which are the priority features that they want and value on Country. *Paleert Tjaara Dja* – the Wadawurrung Healthy Country Plan (2020) provides a measure of the health of these values based on a series of indicators. The values that relate to biodiversity include bush tucker, medicines and resources; yulluk (waterways, rivers, estuaries and wetlands); inland, coastal and warre (sea) Country and native animals. The health of these values, according to the Wadawurrung people, are identified in Table 4-2 (as specific to the Moorabool River Reserve).

Table 4-2: The health of important values along the Moorabool River according to the Wadawurrung people⁶

VALUE	INDICATORS	HEALTH
Bush tucker, medicines and resources	<ul style="list-style-type: none"> % of Wadawurrung bushtucker available 	Fair condition – needs a lot of support
Yulluk – waterways, rivers, estuaries and wetlands	<ul style="list-style-type: none"> Water quality Amount of water Cultural flows % of economic access to water Number of artificial barriers in waterways 	Fair condition – needs a lot of support
Inland Country	<ul style="list-style-type: none"> Extent of volcanic grasslands Age classes of woodlands % of grasslands with cultural burning % of cultural foods in grasslands 	Poor condition – needs urgent attention
Native animals	<ul style="list-style-type: none"> Numbers of different types of native animals Numbers of threatened species: Striped Legless Lizard, Golden Sun Moth, Growling Grass Frog Number of Wadawurrung people who know and are looking after their totemic animals 	Fair condition – needs a lot of support

Most values are identified as being in fair condition, in that they need a lot of support. Inland Country, which relates to the Victorian Volcanic Grasslands areas is identified as being in poor condition and in need of urgent attention to improve the ecological functioning and provision of cultural values. This is consistent with conventional Western ecological assessments that have determined that only five per cent of the original extent of the Victorian Volcanic Grasslands remain and less than one per cent are thought to be intact and of high diversity⁷.

To gain first hand insights into the values of the Moorabool River Reserve for the Wadawurrung People, a 'Walk on Country' was held with Wadawurrung Traditional Owners on 27 February 2023 (refer Figure 4-2).

⁵ DELWP, 2017.

⁶ WTOAC, 2020.

⁷ Greening Australia & Corangamite Catchment Management Authority (date n/a). *Grasslands and Grassy Woodlands of the VVP – Landholders Guide*. URL: https://www.greeningaustralia.org.au/wp-content/uploads/2017/11/GUIDE_VVP_Grasslands.pdf (Accessed 8 Dec 2021).

4.3 POST COLONISATION HERITAGE

Whilst the Moorabool River Reserve does not contain any registered heritage sites, it adjoins the historic Moorabool Railway Viaduct to the north (refer Figure 4-3), with the historic Batesford Bridge and Travellers Rest Inn located to the south of the reserve. These sites have been listed on the Victorian Heritage Register (VHR).

Moorabool Railway Viaduct

The 440-metre-long Moorabool Railway Viaduct constructed of bluestone and iron was opened in 1862 to carry the Geelong-Ballarat railway over the Moorabool river valley north of Batesford. It remains in use today, having been reinforced with extra steel piers in 1918, to a design of Victorian Railways engineer Frederick Esling. The Moorabool Railway Viaduct is on the Geelong-Ballarat Railway line and is listed by Heritage Victoria on the VHR.⁸⁹



Figure 4-3: View looking north to the historic Railway Viaduct¹⁰

Batesford Bridge

Batesford was originally the site of a ford over the Moorabool River. The first bridge at Batesford was built by the Corio and Bannockburn shire councils in 1846. This first wooden bridge, which was located upstream of the ford and provided with a tollgate, collapsed in 1847. It was rebuilt again in wood in 1848, and was damaged by flood in 1852 and later repaired. A bluestone bridge was built in 1859, which still exists today as a service road next to the Batesford Hotel. A new concrete bridge to take the Midland Highway was built in 1972 on a new alignment.

Travellers Rest Inn

The Travellers Rest Inn on the Midland Highway at Batesford was erected of locally quarried rubble granite in 1849 for licensee John Primrose.¹¹ It is the oldest surviving building in Batesford and one of the earliest constructed wayside inns in Victoria.

⁸ Victorian Heritage Register: <https://vhd.heritagecouncil.vic.gov.au/places/22033#statement-significance> (Accessed 15 March 2023).

⁹ Rail Geelong website: <https://www.railgeelong.com/lineguide/geelong/> (Accessed 15 March 2023).

¹⁰ Photo: T. Wallis, RMCG 2023.

¹¹ National Trust Database: http://vhd.heritage.vic.gov.au/search/nattrust_result_detail/68348 (Accessed 15 March 2023).

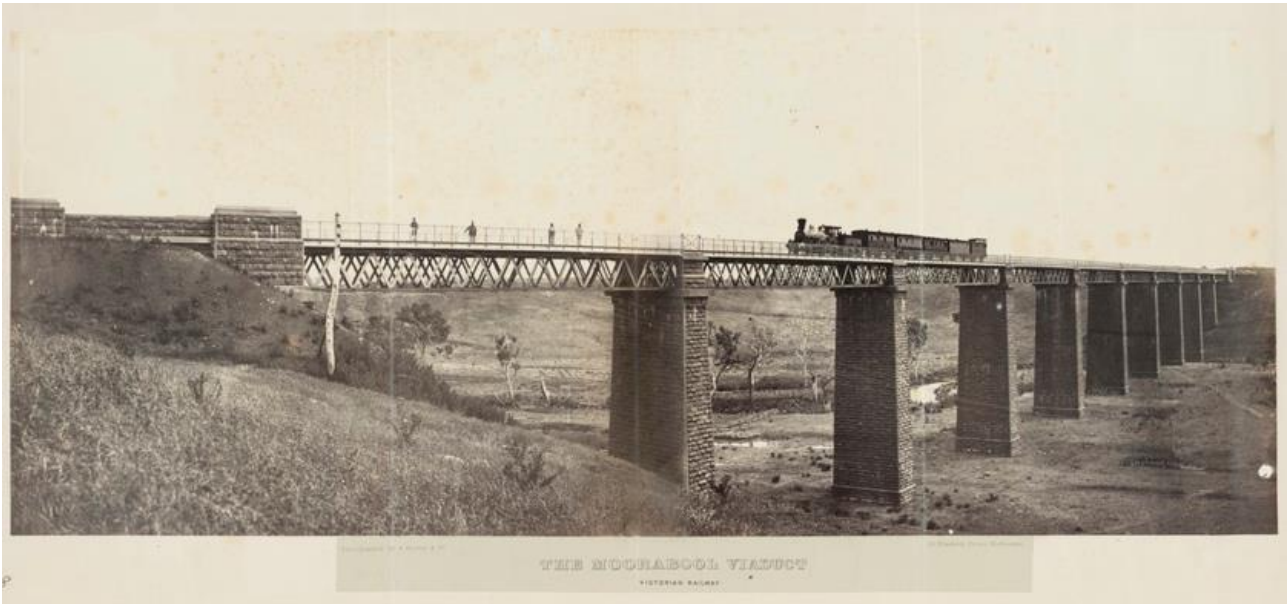


Figure 4-4: Railway viaduct over the Moorabool River, 1863¹²



Figure 4-5: Bridge over the Moorabool River at Batesford¹³

Other nearby heritage places subject to schedule 72 and 73 of the Heritage Overlay under the Golden Plains Planning Scheme include the Chaumont Homestead Complex at 900 Midland Highway Batesford and the Viaduct (cottage), off Hills Road, Batesford.¹⁴

¹² Barwon Blog (2013) *Walking the line*. URL: <http://barwonblogger.blogspot.com/2013/06/walking-line.html> (Accessed 23 February 2022).

¹³ Cornish, R (2016), Sydney Morning Herald. URL: <http://barwonblogger.blogspot.com/2013/06/walking-line.html> (Accessed 23 February 2022).

¹⁴ Golden Plains Planning Scheme. <https://planning-schemes.app.planning.vic.gov.au/Golden%20Plains/ordinance>. (Accessed 15 March 2023).

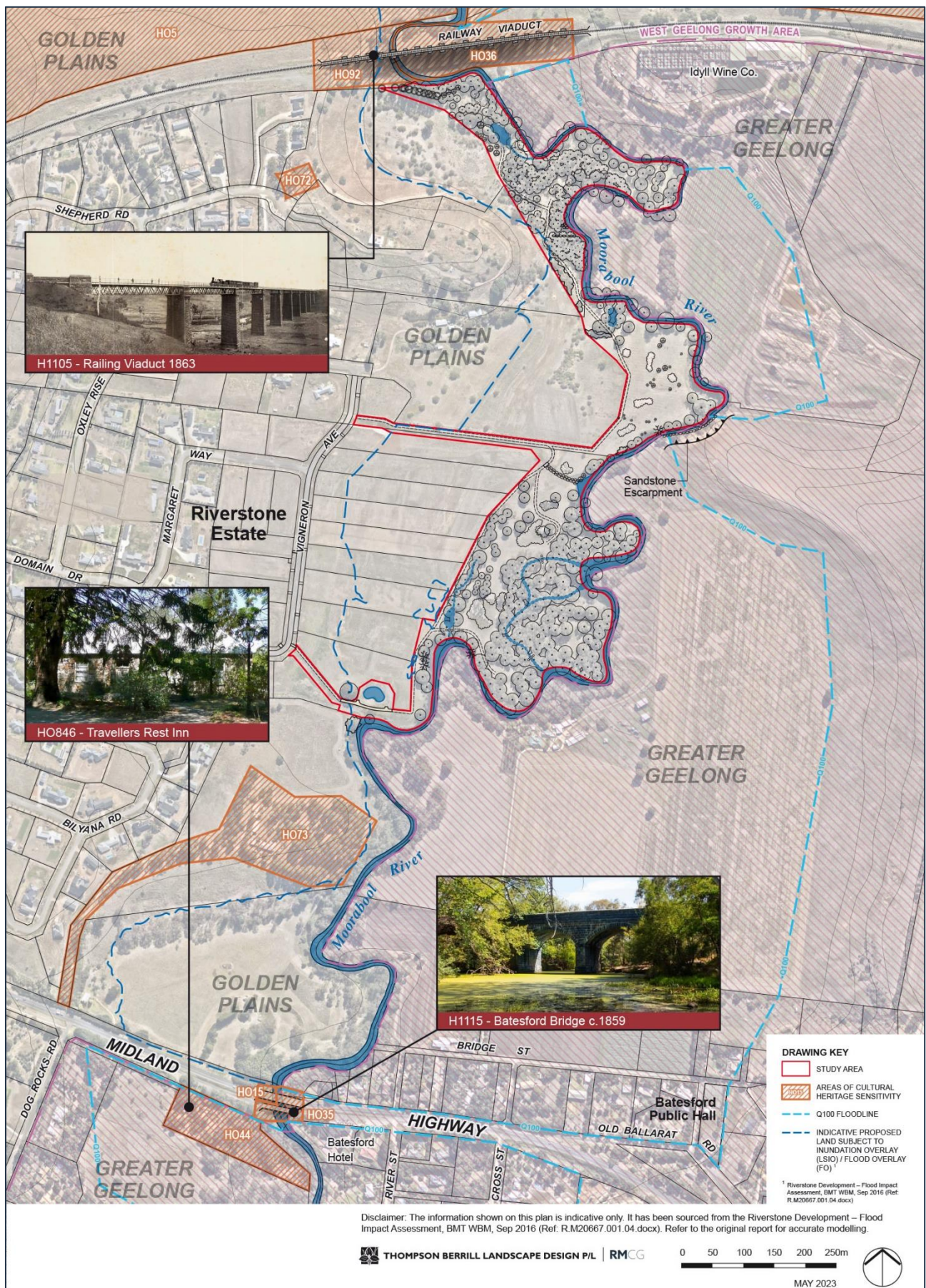


Figure 4-6: Map of historic heritage near the reserve

5 Environment



Figure 5-1: View looking north along the Moorabool River Reserve¹⁵

5.1 NATIVE VEGETATION AND HABITATS

Most of the surrounding landscape has been cleared and the thin linear strip of vegetation along the banks of the Moorabool River represents some of the last remaining areas of remnant native vegetation in the landscape. The native vegetation that remains provides important habitat connectivity for fauna species while in-stream vegetation provides habitat for a range of aquatic species including Platypus (refer Figure 5-3).

Ecological Vegetation Communities (EVCs) have been mapped for the area. The endangered Floodplain Riparian Woodland is the predominate EVC along the banks of the Moorabool in the reserve. Floodplain Riparian Woodland is characterised by open eucalypt woodlands to 20m tall over a medium to tall shrub layer, with a ground layer consisting of amphibious and aquatic herbs and sedges¹⁶

Since European settlement native vegetation has undergone major changes. Land clearing for agriculture, industry and urban development has been one of the major forces contributing to the widespread loss, degradation and fragmentation of native vegetation. Other factors have also had an influence and include pest plants and animals, diseases, disturbances such as fire or floods, inappropriate land use and/or land management and climate change. Regionally, the Corangamite CMA estimates that 25% of the original vegetation remains¹⁷. The loss and degradation of native vegetation has far-reaching consequences for biodiversity. This includes the loss of flora and fauna species and an overall decline in species diversity, and an increase in salinity and soil erosion, poor water quality and the spread of exotic species.

¹⁵ Photo: T. Wallis, RMCG 2023.

¹⁶ DELWP, 2022.

¹⁷ Corangamite CMA, 2021.

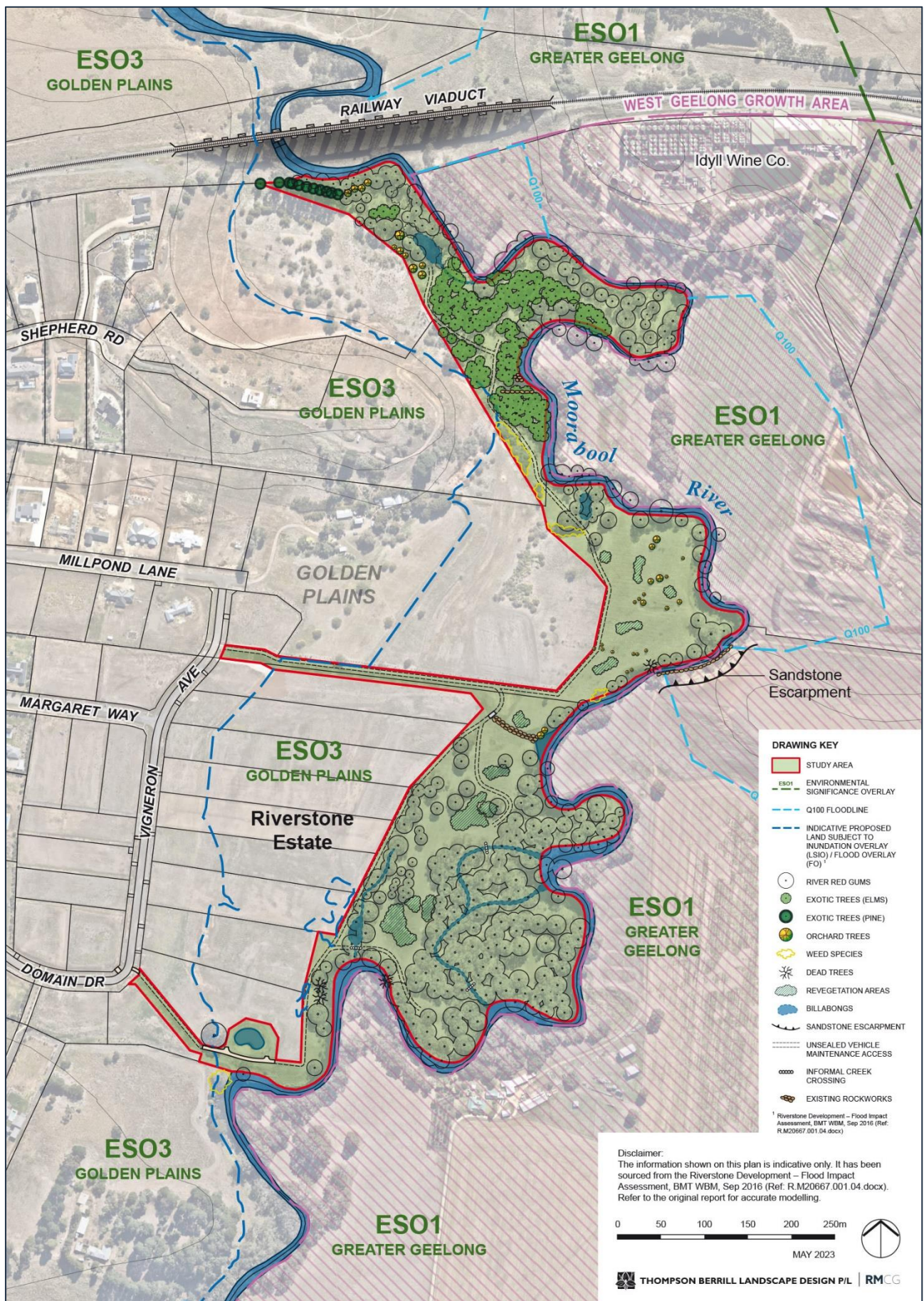


Figure 5-2: Environment



Figure 5-3: Platypus (Wad-dirring/Perridak)¹⁸ commonly found throughout the lower Moorabool River

THREATENED SPECIES LEGISLATION

There are two main pieces of legislation that recognise threatened flora and fauna species in Victoria – the federal *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* and the state *Flora and Fauna Guarantee Act 1988 (FFG Act)*.

The *EPBC Act (1999)* is the Australian Government’s central environmental legislation. It provides the legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities, and heritage places. Listed species are categorised as being either critically endangered, endangered, vulnerable, extinct, extinct in the wild or conservation dependant.

The Victorian *FFG Act (1988)* is the primary piece of state legislation that provides for the conservation of biodiversity and the management of associated potentially threatening processes. Categories for threatened species are critically endangered, endangered, vulnerable, or in the case of a taxon of fish, conservation dependant.



Figure 5-4: South east section of the reserve showing existing remnant vegetation¹⁹

¹⁸ Photo: istock image.

¹⁹ Photo: T. Wallis, RMCG.

ECOLOGICAL VEGETATION CLASSES

One EVC has been mapped as occurring along the Moorabool River Reserve (refer Table 5-1), which is listed as endangered in Victoria.

Table 5-1: Ecological Vegetation Classes in Zone 1 and their conservation status

EVC NO.	EVC	BIOREGIONAL CONSERVATION STATUS
56	Floodplain Riparian Woodland	Endangered

The endangered Floodplain Riparian Woodland is the predominate EVC along the banks of the Moorabool in the section just south of Lethbridge to Batesford. Floodplain Riparian Woodland is characterised by open eucalypt woodlands to 20m tall over a medium to tall shrub layer with a ground layer consisting of amphibious and aquatic herbs and sedges²⁰. Threats to this community include illegal removal, decline of large old trees with limited replacement, altered water flows and weed invasion.

THREATENED FLORA

There are no threatened flora species; either at the Federal or State level, that have been recorded in the reserve.



Figure 5-5: Critically endangered Swift Parrot (*Lathamus discolor*)²¹

THREATENED FAUNA

The survival of threatened fauna species depends a great deal on the health of native vegetation and the continuing existence of other important habitats including waterways and wetlands. The area and quality of native vegetation is often a determinant of what species will occur where. The significant loss, fragmentation

²⁰ DELWP, 2022.

²¹ Photo: Australian Geographic (2017). URL: <https://www.australiangeographic.com.au/news/2017/10/scientists-call-on-public-to-help-save-swift-parrot/> (Accessed 8 March 2023).

and decline in the condition of remaining areas of native vegetation across the Golden Plain Shire corresponds with a loss and decline in native fauna species. According to the Corangamite CMA, the trend for native fauna has generally been on a downward trajectory since large scale land clearing, with the majority of native fauna occurring in protected areas or in locations that are not readily accessed by competition or predators²².

The remaining areas of native vegetation that stretch along the banks of the Moorabool River provide very significant habitat for threatened fauna species. These linear reserves provide habitat corridors for birds, fish and Platypus; large remnant trees and logs provide hollows and other habitat for birds, mammals and reptiles; and throughout the in-water habitat supports a range of aquatic species including Platypus and the threatened Growling Grass Frog and Australian Grayling.

There are records of four threatened fauna species that occur in or near Moorabool River that are listed under the Commonwealth *EPBC Act (1999)* and/or the Victorian *FFG Act (1988)*. This includes four bird species. The Swift Parrot is listed as critically endangered under the *EPBC Act (1999)*. The full list of threatened fauna species is provided in Table 5-2.

Table 5-2: Fauna species listed under the Australian *EPBC Act (1999)* and/or the Victorian *FFG Act (1988)* that occur in the reserve CE = Critically Endangered; E = Endangered; V = Vulnerable; NT = Near Threatened

SPECIES	TAXON	EPBC	FFG
Swift Parrot (<i>Lathamus discolor</i>)	Bird (non-passerine)	CE	E
Nankeen Night Heron (<i>Nycticorax caledonicus hillii</i>)	Bird (non-passerine)		NT
Brown Treecreeper (south-eastern ssp.) (<i>Climacteris picumnus victoriae</i>)	Bird (passerine)		NT
Eastern Great Egret (<i>Ardea modesta</i>)	Bird (non-passerine)		V

5.2 KEY THREATS

CLIMATE CHANGE

The Moorabool region of Victoria has become warmer and drier, reflecting a trend that is expected to continue in the future. Likely impacts include increasing year-round temperatures, fewer frosts, more frequent and more intense rainfall events, more hot days and warm spells, less rainfall in autumn, winter and spring, harsher fire weather and longer fire seasons²³.

Biodiversity in Victoria has been in serious decline over the past two centuries because of land clearing, fire, pest plants and animals, land development, altered hydrological regimes and water pollution. Climate change is likely to amplify these threatening processes and reduce the resilience of flora and fauna species to adapt. Future declines or losses of local populations and species extinctions are a possible result. As the climate becomes less suitable for existing vegetation communities, it is likely that there will be a gradual change in species composition and dominance as some species and communities are replaced by others, leading to a shift in the floristics and structure of the community.

Species with highly specific habitat requirements, limited dispersal ability or those in fragmented habitats may decline or become extinct. This includes temperature sensitive plants and animals that cannot move to a more suitable climate.

²² Corangamite CMA, 2021.

²³ SGS, 2020b p. 41.

POPULATION GROWTH AND VISITOR PRESSURE

The adjoining City of Greater Geelong has experienced strong population growth in recent years, and this is likely to continue with the population expected to grow to 387,900 by 2036²⁴ - an increase of more than one third on the City's 2018 estimated resident population. Greater Geelong is the fastest growing regional centre in Victoria and population has been growing at a rate higher than Victoria and Greater Melbourne (although this growth is still less than the fast-growing municipalities in Melbourne's growth areas)²⁵.

The increase in population has resulted in rapid urban expansion across the City and the adjoining Golden Plains Shire. Future growth will be directed to the Northern and Western Geelong Growth Areas. This growth area, which is the largest urban growth project in regional Victoria, comprising 5,367ha²⁶ is located immediately adjacent to the Moorabool River Reserve on the eastern bank of the Moorabool River. With regards to biodiversity, the significant population growth and urban expansion will continue to put pressure on the remaining natural assets in the Shire, particularly through increased numbers of people wanting to access natural areas.

PEST PLANTS AND ANIMALS

Pest plants and animals are a considerable problem in the reserve as they compete with native species for resources, prey on native fauna, cause erosion and other physical disturbances, and can affect the functioning of ecosystems. Established pest animals in the Moorabool River Reserve include rabbits, foxes, and feral cats.

Pest plants are a risk to regional biodiversity and agriculture and can impact land values. They also invade native vegetation, provide habitat for pest animals and increase fuel loads for fire.

Declared weeds found within the reserve include: Serrated Tussock, Chilean Needle Grass, Boxthorn, Montpellier Broom, Briar Rose and Spear Thistle.

Environmental weeds species found within the Reserve include: Cocksfoot, Soursob, Toowoomba Canary-grass, Plum trees, Firethorn, Pepper Trees and Dutch Elms.

Under the *Catchment and Land Protection Act 1994* Council is responsible for the control of established pest animals and declared weeds on land that it manages. Council conducts an annual control program for declared pest plant and animal species in the Reserve. Council conducts control of environmental weed as resources allow.

INAPPROPRIATE RECREATIONAL USE

The results of the community engagement (refer Section 3) identified that the community is concerned about the negative impacts that motorbikes, trail bikes and other motorised vehicles (such as utes and 4WD) have on the natural and cultural values of the reserve.

Motorised recreational vehicles disturb wildlife and reserve visitors, damage soils and vegetation and are considered an inappropriate and damaging use in a nature reserve.

Other recreational activities in the reserve that the community considered inappropriate included dogs off lead, BMX and mountain bike tracks, camping and camp fires.

²⁴ City of Greater Geelong, 2020.

²⁵ City of Greater Geelong, 2020b.

²⁶ Ibid.

Dogs off-lead disturb, chase and in some cases kill native wildlife, while construction of BMX tracks and jumps creates risk issues for Council and can damage native vegetation. Camping or fires within the reserve damage native vegetation and create fire risk.

MANAGEMENT RESOURCES

Currently, there is only limited funding and resources available to undertake regular ongoing management and maintenance of the reserve.

Funding for initiatives like construction of visitor infrastructure or stormwater upgrade may be able to be sourced through external grants. However, the ongoing maintenance of infrastructure requires a reliable source of funding and resourcing.

If no additional funding is allocated to this reserve, it will limit the ability of the Shire to implement the goals and objectives outlined in this Masterplan.

WATERWAY MANAGEMENT

Waterways act as connections between catchments, aquifers, riparian zones, estuaries and the marine environment and their health and functioning can substantially impact upon these dependent ecosystems²⁷. The wellbeing and prosperity of the local community is also dependant on healthy waterways and catchments. Waterways are the lifeblood for many communities, for example, the rural communities to the north are strongly characterised by the Moorabool River. The waterways are also culturally very significant for the Wadawurrung Traditional Owners, who managed water sustainably over thousands of generations.

The health of the Moorabool is linked to land use. Since European settlement, human interactions with waterways, through changes in and intensification of land use, as well as modification of the natural environment, have led to altered water flows and a decline in waterway health²⁸. Waterways in the region remain under significant pressure today from population growth and urbanisation, climate change and catchment-based impacts.

The Moorabool is identified as one of the most flow-stressed waterways in Victoria and its overall condition ranges from very poor in the lower reaches to moderate in the northern reaches around Steglitz and Meredith.

The Moorabool River is a source of potable water for the rapidly growing cities of Ballarat and Geelong and is highly regulated by water storages and weirs, the largest being Lal Lal Reservoir, which provides water for Ballarat as well as Geelong and Meredith. There are also several large water storages in the upper reaches of the catchment and nine private diversion weirs in the lower reaches between She Oaks and Batesford.

Flow deviation through major upstream storages to supply urban water, land use, and licenced and unlicensed extraction have all impacted on quantity and quality of flows in the river. Sedimentation and sand accumulation brought about from these flow changes have also negatively impacted on the habitat of fish species, reducing flow and habitat diversity and posing a significant barrier to fish migration.

Also of note is the lower reach of the Moorabool, from She Oaks weir to the confluence with the Barwon River. This reach contains eight species of native fish including Tupong, Southern pygmy perch, Australian grayling, Common galaxid and Spotted galaxid²⁹.

Poor management of the reserve may have detrimental impacts on the adjacent Moorabool River.

²⁷ Corangamite CMA, 2021.

²⁸ Ibid.

²⁹ Corangamite CMA, 2021.

WATERWAY CONDITION

Index of Stream Condition

The Index of Stream Condition (ISC) is the only state-wide assessment of river condition in Australia. The ISC is an integrated measure of environmental condition based on parameters such as water quality, hydrology, vegetation, physical form and aquatic life. The third, and most recent, ISC was conducted in 2010 and draws on data for the period 2004-2010. The reach of the Moorabool River adjoining the Moorabool River Reserve (Reach 1, Moorabool Basin) has been assessed being of very poor condition, with low scores for stream side zone, aquatic life and water quality.³⁰

In recent years, the Moorabool River has been the focus of significant government investment to improve native vegetation and habitat within and alongside the river; provide water for the environment to maintain water quality and improve habitat for fish and platypus; to improve and maintain the waterway for cultural values; and to improve the community's connection to the river through improving engagement, awareness and sustainable recreational use³¹. The Living Moorabool project stemmed from a community desire for a healthier river that can support a range of benefits. Corangamite CMA are leading the Living Moorabool project, working in partnership with WTOAC and the local community.

In respect to the river's relationship to the adjoining Moorabool River Reserve, appropriate management of the reserve will contribute to or ameliorate localised threats to the waterway (e.g. poor management of the reserve and drainage infrastructure associated that passes through the reserve).



Figure 5-6: The Moorabool River adjoining the reserve³²

³⁰ DEPI, 2013.

³¹ DELWP, 2020

³² Photo: T. Wallis, RMCg, 2022.

6 Flooding and Drainage

6.1 FLOODING

Flooding around the Moorabool River at Batesford can occur after consecutive days of moderate to heavy rainfall in the area causing the river level to rise.

Significant riverine floods have been recorded in 1911, 1916, 1952, 1978 and 1995, along with smaller recent floods in January 2011 and September 2016³³. For example, in 1995, the Moorabool River at Batesford flooded 10 properties, including the hotel. This 1995 flood was considered a 1.25% AEP, (average annual recurrence interval of 80 years).

In minor to moderate flood events, the flood water is generally contained to the floodplain area adjacent to the waterway, also impacting on some Crown and agricultural land. In November 2022 the reserve was fully inundated for almost a week with overland flows active across the rear of private properties on Vigneron Avenue.

A major flood study was conducted of the lower Moorabool and Barwon Rivers by Water Technology for the Corangamite CMA in 2019. The flood study included the area of the Moorabool River Reserve³⁴, which had also been the subject to the Riverstone Development – Flood Impact Assessment³⁵ (Refer Figure 5-2), which shows the extent of the 20% and 1% Average Exceedance Probability (AEP) flood events.

The results of the Water Technology study are detailed further below for the both the 20% and 1% flood events.

20% AEP Flood Event

- Gauge height: 3.80 m (20.91 mAHD) at the Batesford Gauge
- Velocity: 102 m³ /s peak flow

This study found that for the 20% AEP flood event that flood extents are generally limited to the low-lying floodplain areas adjacent to the Moorabool River. Primarily Crown and agricultural land are impacted in these smaller events.

Minor breakouts can occur for the 20% AEP event, with the flood extents a maximum of 125m from the banks of the Moorabool River, however, larger breakouts can occur under the 10% event north of Batesford. The flood extents reach a maximum of 250m from the river banks.

1% AEP Flood Event

- Gauge height: 4.75 m (21.86 mAHD) at the Batesford Gauge
- Flow rate: 427 m³ /s peak flow

This study found that for the 1% AEP flood event that water levels are increased by 0.95m compared to the 20% flood event. Under this flood event the Midland Highway downstream is flooded with a width of approximately 200m inundated. The downstream Batesford Hotel is partly impacted by floodwaters up to 0.2m deep.

The implications of these floods for the Masterplan and management of assets and access are detailed below.

³³ SES, 2021.

³⁴ Water Technology, 2019.

³⁵ TGM, 2009.

FLOODING CONSIDERATIONS

Given the results of this flood study, large parts of the Moorabool River Reserve are subject to regular inundation.

In line with Melbourne Water's 'Shared-pathways-guidelines', paths should be located above the 10% AEP flood level where possible. If this cannot be achieved, a package of safety measures such as passive drown outs is to be used to restrict public access to paths subject to more frequent flooding and to provide alternative escape routes to higher ground avoiding areas subject to flow/depth velocities greater than 0.35m/sec.

Public access to the Moorabool River Reserve at Batesford is currently limited to two access points. The overland flow paths crossing these access points have been defined by low sections of concrete path which are inundated with water more quickly than surrounding areas effectively forming passive drown outs which effectively restrict public access into the reserve during flood events (refer Figure 6-1).

Establishment of bridges or culverts over these overland flow paths is not desirable as it would allow access into the reserve during flood events making it more difficult to manage public risk and these impacts have been considered in the planned management of the Moorabool River Reserve under this Masterplan.



Figure 6-1: View looking east along the entrance to Moorabool River Reserve showing the effects of minor flooding³⁶

³⁶ Photo: D. Smithyman, GPS, 2022.

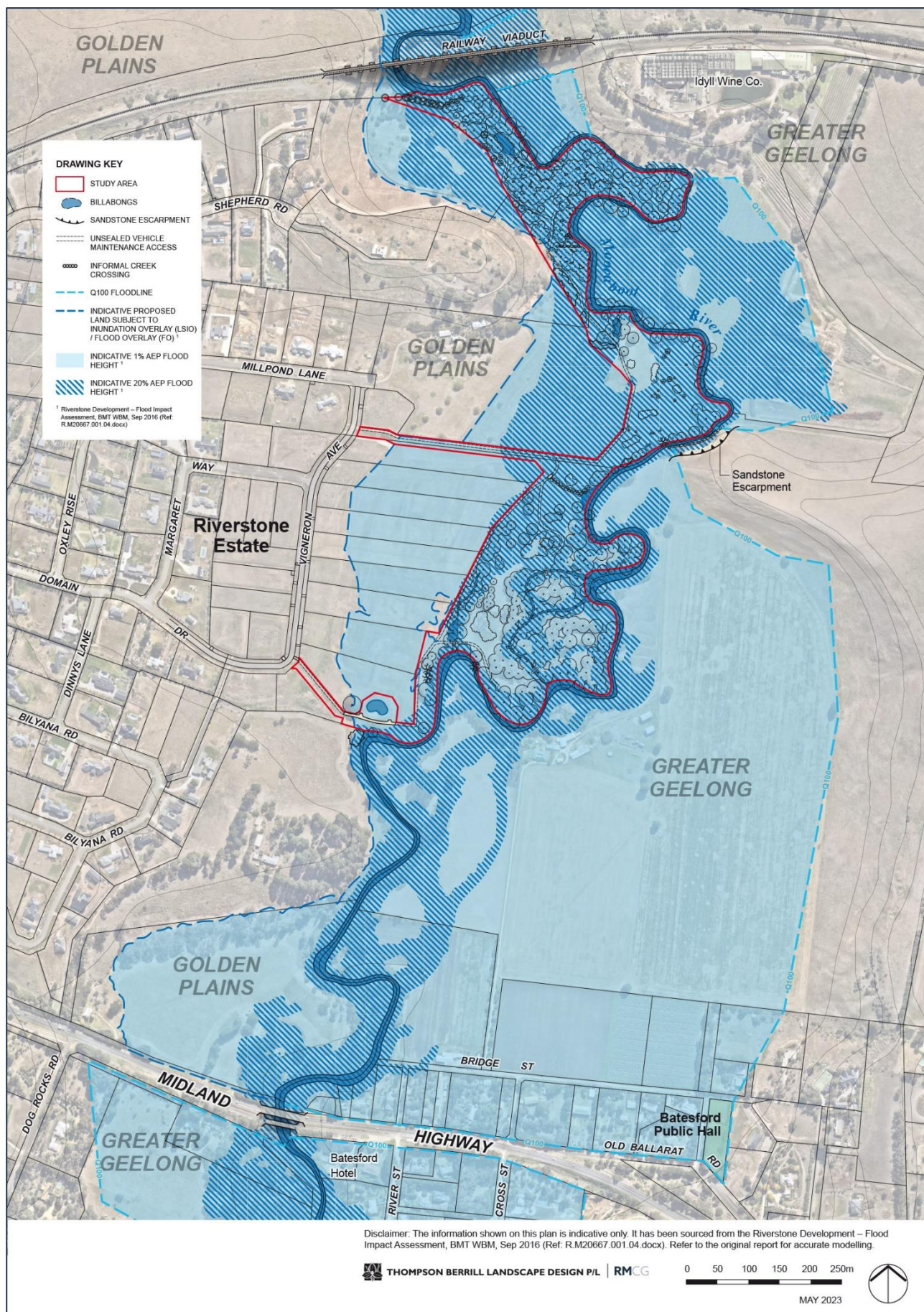


Figure 6-2: Floodplain extent

6.2 DRAINAGE

A report on management of stormwater outfalls from the Riverstone development was completed in 2009 by TGM³⁷. This report indicated by adopting water sensitive urban design principles, the stormwater generated from the Riverstone Estate can be managed by a combination of mown grass swale drains, underground pipes and rock outfall structures. With these structures in place, the report indicates the stormwater generated from the site will be similar to the discharge rates of previous predevelopment rural land. As shown in Figure 6-3, 6-4 and 6-5 below, this stormwater infrastructure has been installed and has been duly considered in the development of this Masterplan.



Figures 6-3, 6-4, 6-5: Clockwise from top left: mowed swale drain at the southern access point, stormwater retention wetland, and rocky swale drain installed to capture stormwater run-off from the adjoining Riverstone development³⁸³⁹⁴⁰

While these measures were deemed adequate at the time, opportunities to improve the water quality treatment and enhance the biodiversity and landscape value of these mown grass drainage swales have been considered as part of the Masterplan. Improvements to the piped stormwater drainage and stormwater treatment should be investigated to reduce impacts on the adjoining Moorabool River. Slightly increasing the depth of the channel at the start and end of the swale drains linking into the reserve to detain additional stormwater runoff will allow revegetation of these areas using indigenous sedge and rush species. This will enhance sediment and nutrient removal and groundwater recharge within the existing system without substantially altering the hydraulic flow regime and creating upstream flooding.

³⁷ TGM, 2009.

³⁸ Photo: E. KwetOn, TBLD, 2023.

³⁹ Photo: E. KwetOn, TBLD, 2023.

⁴⁰ Photo: T. Wallis, RMCG 2023.

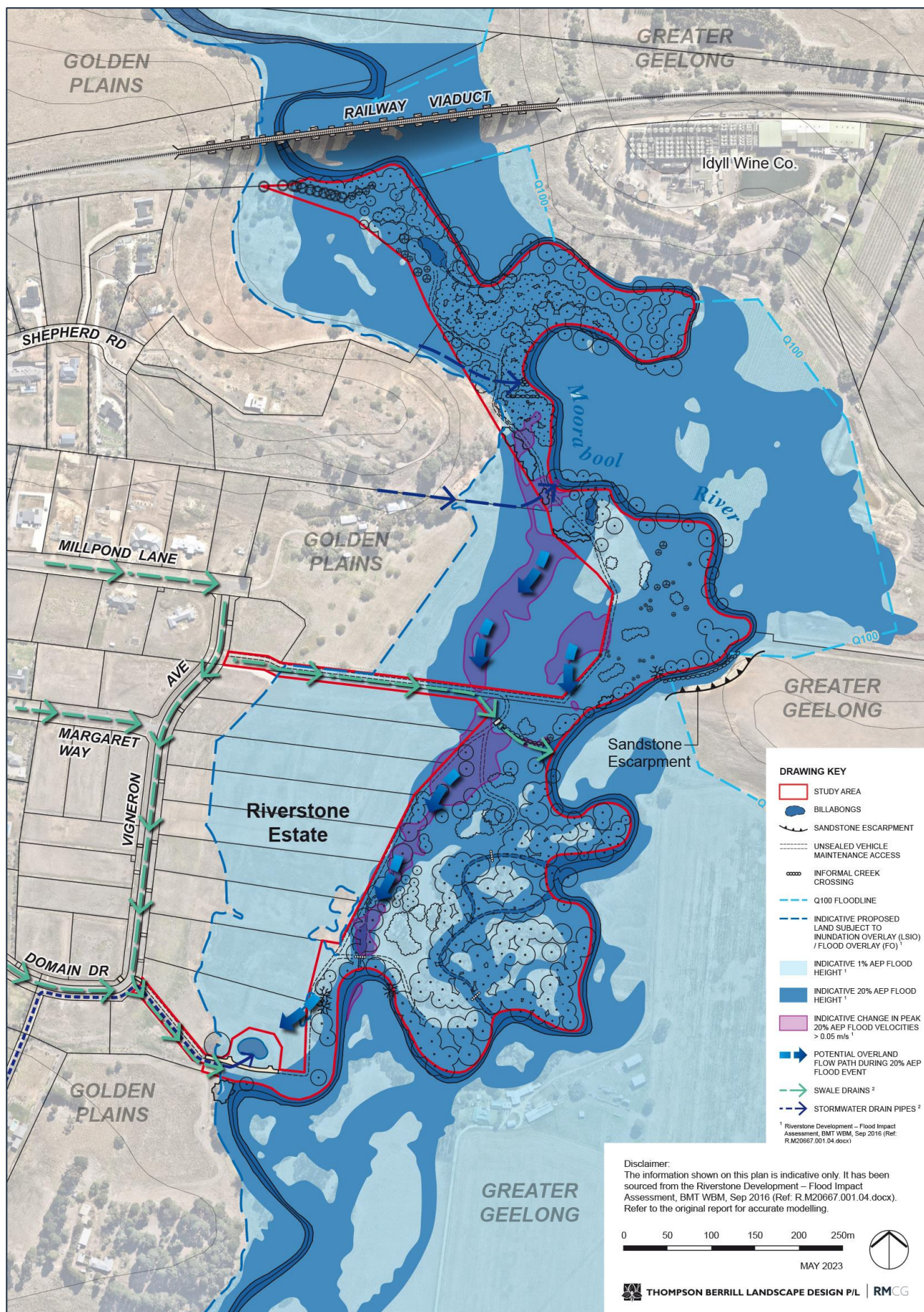


Figure 6-6: Drainage and water quality

7 Recreation values



Figure 7-1: Recreational walking within the Moorabool River Reserve⁴¹

7.1 MOORABOOL RIVER RECREATION

The Moorabool River joins the Barwon River at Fyansford at the western edge of Geelong. Before joining the Barwon, it flows through an area earmarked for development known as the Western Geelong Growth Area. Current recreation activities on the Moorabool through Geelong are mostly limited to the Fyansford area, using the river in the semi-rural region north of Geelong; however, it is expected that the Moorabool River corridor will become an essential focal point for the Western Geelong Growth Area.

CURRENT USES OF THE MOORABOOL RIVER

Table 7-1 summarises some of the facilities and current uses of the broader Moorabool River. In addition to those listed, other activities along the length of the river include swimming, fishing, bird watching and some bushwalking where public access to the river is possible. There are significant sites with stands of remnant vegetation that also provide access points for the community to enjoy the Moorabool River. The Moorabool River Reserve forms one of these sites. Other sites along the Moorabool are⁴² at Morrisons, Slate Quarry Road, Meredith Education Area, Coopers Bridge, Sharps Crossing, Russells Bridge, Perdrisat Road and via the City of Greater Geelong Moorabool River Reserve off Dog Rocks Road.

⁴¹ Photo: E. Kwet-on, TBLD, 2022.

⁴² Corangamite Catchment Management Authority (2022) *Discover the Living Moorabool*. URL: <https://www.ccmaknowledgebase.vic.gov.au/moorabool/florafauna.php> (Accessed 24 Jan 2022).

Table 7-1: Facilities and uses of the Moorabool River and its parklands⁴³⁴⁴

LOCATION / PARKLAND	USES
Lower Moorabool	
Fyansford Common	<ul style="list-style-type: none">▪ Walking and cycling▪ Picnics▪ Environmental values.
Batesford	<ul style="list-style-type: none">▪ Swimming area▪ Historic attraction (Blue Stone Bridge).
The business associated with direct river use/visitation	<ul style="list-style-type: none">▪ Fyansford Hotel▪ Batesford Hotel▪ Truffleduck.

Whilst these sites provide opportunities for locals and visitors to enjoy, generally there has been limited existing open space within the vicinity of the Batesford township. Accordingly, the Moorabool River Reserve provides a critical opportunity to address this need and become the cornerstone for Batesford's open space network.

ANTICIPATED FUTURE USES OF THE MOORABOOL RIVER: WEST GEELONG GROWTH AREA

The Northern and Western Geelong Growth Areas combined are the most significant urban growth project in regional Victoria with the potential to welcome more than 110,000 new Geelong residents. The project will address the long-term growth needs of Geelong, facilitating diverse and affordable housing and employment opportunities for the city over the coming decades. The Northern Geelong Growth Area, in Lovely Banks, is anticipated to deliver up to 18,000 new dwellings for a population of approximately 48,000 residents. The Western Geelong Growth Area in Batesford is expected to deliver up to 22,000 new residences for approximately 62,000 residents. The Western Geelong Growth Area includes more than 20 kilometres of river frontage to the Barwon and Moorabool Rivers and Cowies Creek⁴⁵, and includes land opposite the Moorabool River Reserve on the eastern bank of the Moorabool.

The extension of parklands through this area (the lower Moorabool from Fyansford to Batesford) has been identified as a key opportunity for the Masterplan being developed under the Kitjarra-dja-bul Bullarto langi-ut project⁴⁶ and will lead to additional and extended active and passive recreational river side use, including some on river use through paddle sport activities.

⁴³ <https://www.geelongaustralia.com.au> (Accessed 15 March 2023).

⁴⁴ SKM, 2004.

⁴⁵ DELWP, 2018.

⁴⁶ RMCG, 2019.

7.2 RESERVE RECREATION

EXISTING INFRASTRUCTURE AND USES

The Moorabool River Reserve at Batesford is the only accessible open space area within the Riverstone Estate. Use is currently limited to informal walking as the reserve is generally only accessible by private transport with no existing pedestrian open space connection north or south or on the east bank which remains private property.

There are two designated public car parks opposite the two entries to the reserve from Vigneron Avenue and extensive informal roadside parking on both sides of the wide adjoining roads with concrete footpath connection back to the reserve entries (refer Figure 7-2). Maintenance vehicle access into the reserve is via an unsealed track with concrete sections where subject to overland flow (refer Figure 7-3). The limited reserve access and flooding make these tracks unsuitable for public vehicle access (refer Figure 7-4).



Figure 7-2: Vigneron Avenue showing available parking⁴⁷

There are currently no recreational facilities or seats in the reserve and access is limited to informal walking via mown grass tracks. Steep sided former river channels and billabongs limit access to sections of the reserve. The lack of recreational facilities means there are limited opportunities for people to use the reserve.

The frequency of flooding in the reserve restricts opportunities for new recreational infrastructure, which must be able to withstand periods of inundation and avoid the creation of ongoing maintenance problems.



Figure 7-3: Southern access point from Vigneron Avenue⁴⁸

⁴⁷ Photo: E. KwetOn, TBLD, 2022.

⁴⁸ Photo: E. KwetOn, TBLD, 2022.

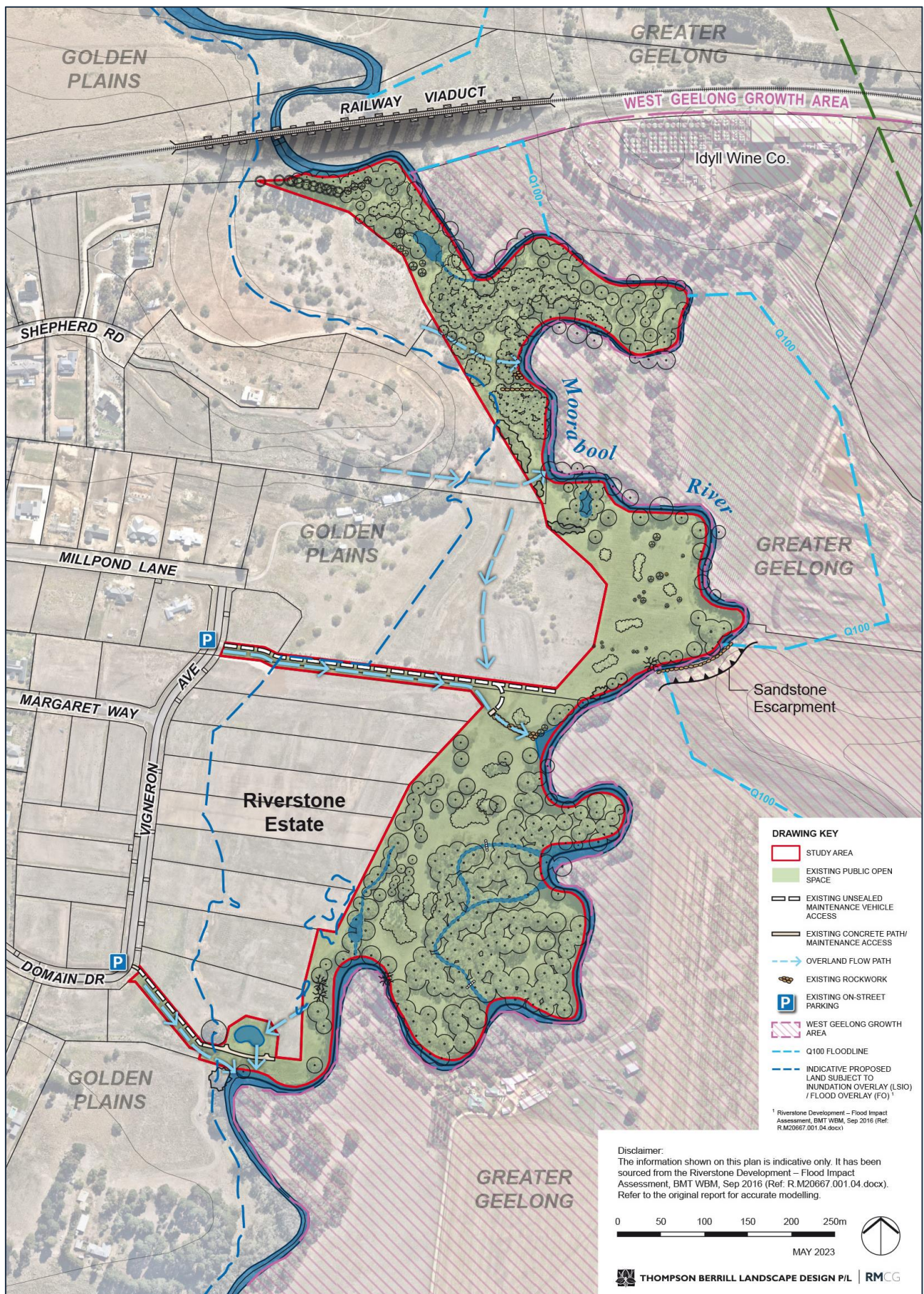


Figure 7-4: Existing access and facilities.

CURRENT AND FUTURE USES OF THE RESERVE

The results of the community survey (refer Section 3) identified the most popular recreational use of the Moorabool River Reserve is walking. This was followed by walking the dog, bird watching/observing wildlife, children being able to play in an unstructured place and nature appreciation.

The survey results also identified that the community highly value the natural values of the reserve with improving biodiversity being the highest priority issue to be addressed.

The survey also identified the community would like to see additional paths established in the reserve to improve opportunities for walking.

Other recreational facilities the community would like to see in the reserve include picnic areas, looped walking tracks, fishing and nature-based play.

The provision of new recreation facilities will encourage more people to use the reserve and make it more accessible. However, new recreational infrastructure or uses must be cognizant of the natural and cultural values of the reserve and not act to the detriment of the values

The community survey also clearly identified a desire to prevent access for motorised vehicles including trail bikes.

POTENTIAL FUTURE OPEN SPACE AND TRAILS

As part of the Masterplan being developed under the Kitjarra-dja-bul Bullarto langi-ut project, potential future open space has been identified and shown on the east side of Moorabool River and extending further south on the west side of the River from the Moorabool River Reserve. The Masterplan has also identified a future network of trails. Refer to Figure 7-5 for potential future open space, access points, trails and facilities as part of the Kitjarra-dja-bul Bullarto langi-ut project.

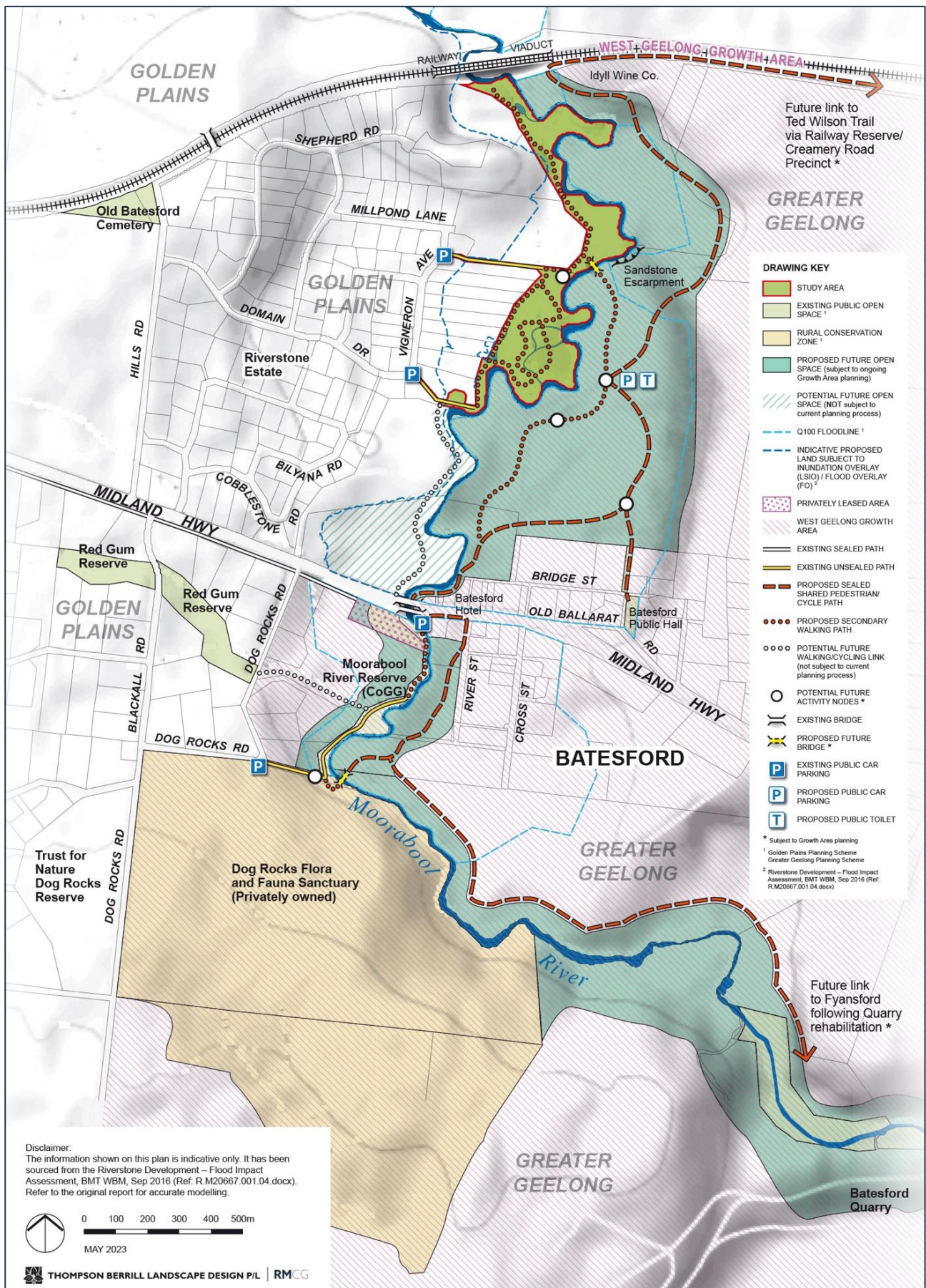


Figure 7-5: Future potential access and facilities.

PART B: MASTERPLAN



8 Implementation

This Masterplan provides a vision for the area identifying what is important and what it should look like and how it should function into the future. It establishes a framework for ongoing protection and improvement and considers the interrelationship between:

- Current character and functionality of the landscape
- Public expectations and needs delivered by date
- Emerging issues and trends
- The realities of the economic, social, environmental, and legislative context of the time.

The result is a plan that balances need across a range of sometimes conflicting interests. This Masterplan does not necessarily suggest that all elements of the plan should proceed immediately, or that ratepayers and user groups should be responsible for the capital costs in respect of the actions that are progressed.

It is important to note that the intent of this Masterplan is to provide a framework for future management, use and development of the river and open space over an extended period of time so that ad-hoc projects are avoided, and long-term community use and sustainability are maximised. To ensure this intent is achieved the Masterplan will be regularly monitored to ensure the outcomes continue to meet community needs. Refer to Figure 8-4 for the Moorabool River Reserve Masterplan.

8.1 KEY GOALS

To realise the vision for the reserve, the following goals have been identified.

- Protect and improve awareness and appreciation of Wadawurrung values and cultural practices.
- Protect and restore biodiversity and habitat values using shared Wadawurrung knowledge and practices to inform land and water management actions.
- Improve awareness and links to Batesford's historic heritage while continuing staged restoration of the indigenous floodplain riparian woodland ecology.
- Improve public access and provision of low-key recreation facilities where in harmony with floodplain environmental and cultural values.
- Design new climate resilient infrastructure to withstand the impact of increasing flood and bushfire risk while respecting Wadawurrung values and protecting the natural landscape character.

8.2 OVERALL OBJECTIVES AND ACTIONS

The following overall objectives apply to the whole reserve:

- Improve awareness, understanding and appreciation of Wadawurrung values and culture
- Improve walking and maintenance vehicle access.
- Manage visitor impacts to minimise impacts on flora, fauna and other reserve visitors.
- Provide information/interpretation to improve visitor understanding and appreciation of the cultural, historic and natural values of the reserve.
- Restore and improve biodiversity across the reserve through revegetation with local indigenous species.
- Provide climate resilient visitor infrastructure while minimising impacts on flora and fauna and the floodplain.
- Provide appropriate reserve zoning under the Golden Plains Shire planning scheme

- Manage declared weeds and established pest animals and environmental weeds to minimise impacts on flora, fauna and reserve visitors.
- Minimise risk to reserve users.

The specific actions to achieve the overall objectives across the whole reserve are:

- Adopt Wadawurrung naming of the reserve
- Liaise with adjoining landholders to identify and protect cultural values and enhance habitat and natural values within the floodplain on private property.
- Install interpretive signs (Cultural heritage, European heritage, natural values), at key points in the reserve
- Amend the Golden Plains Shire Planning Scheme to rezone the area to Public Park and Recreation Zone (PPRZ)
- Establish and maintain a program of regular mowing of the mown tracks to facilitate visitor access
- Maintain a program of annual control of declared weeds and established pest animals
- Establish and maintain an annual program of control of environmental weeds
- Establish and maintain an annual program of revegetation of the reserve with local indigenous species to strengthen the habitat corridor
- Undertake regular arborist tree assessment to address tree risk
- Install flood warning signage and depth markers at both existing concrete overland flow path crossings
- Establish and maintain a program of regular slashing to maintain the reserve in a fuel reduced state

8.3 MANAGEMENT ZONES, OBJECTIVES AND ACTIONS

To reflect the different management issues and opportunities across the extent of the reserve, the Moorabool River Reserve has been categorised into three distinct management zones, each with its own management objectives (refer Figure 8-1):

- Management Zone 1: Public Access
- Management Zone 2: Conservation
- Management Zone 3: Restoration.

Actions have been prioritised as follows:

- High (H) – 1 to 3 years
- Medium (M) – 4 to 6 years
- Low (L) – 7 to 10 years
- Ongoing (O) – Part of current programs.

Note that all works and activities to be delivered under this Masterplan are subject to available funding.

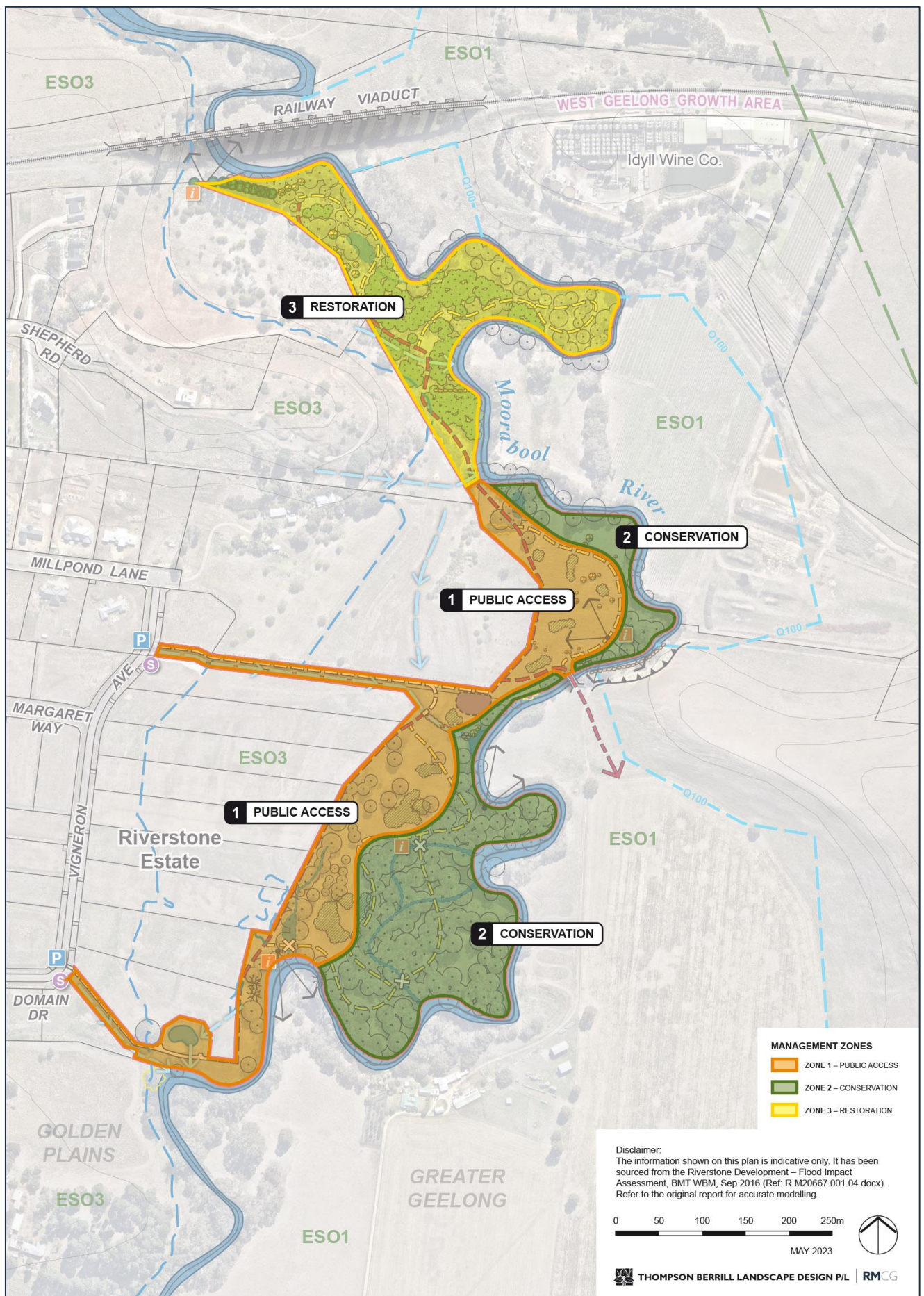


Figure 8-1: Management Zones

MANAGEMENT ZONE 1: PUBLIC ACCESS

This south-western area of the reserve provides two points for community access to the Moorabool River Reserve from Vigneron Avenue. It incorporates the larger central section of the reserve, which adjoins both the Moorabool River to east and the larger existing private properties to the west. This area has been substantially modified in the past and while it still retains many large remnant river red gums, it is mainly an open grass area with scattered recent mixed native planting. The area has clear and open access from the two entry points and some parts are less subject to flooding than other sections of the reserve. Accordingly, this area has been identified as suitable for passive recreational use and provision of low-key recreational facilities that complement the natural values. This area is subject to regular mowing and slashing and contains an informal management access track along its western boundary.

The specific objectives for Management Zone 1: Public Access are to:

- Improve walking and maintenance vehicle access
- Provide passive recreation facilities including built visitor infrastructure that complements the natural character and can withstand periods of inundation and flooding
- Provide entry signs to identify, promote and encourage visitation to the reserve
- Improve stormwater management
- Allow for dog on-lead access only to reduce impacts on native fauna.
- Allow for future pedestrian bridge connection to Western Geelong Growth Area

The specific actions for Management Zone 1: Public Access are:

- Improve access by extending the unsealed 2.5m wide path to provide a maintenance vehicle track and walking path between the two access points.
- Establish a small picnic and seating area with nature-based play space on higher ground adjoining the river
- Establish and maintain a mown grass around the picnic area and nature based play space area for informal passive recreation away from the river
- Select fallen logs and confirm placement on site with the Wadawurrung to provide natural seating/viewing points overlooking the river
- Design and install entry signs at the reserve entry points to identify, promote and encourage visitation to the reserve
- Confirm the location and alignment for future pedestrian bridge to be completed as part of the future open space on the east bank of the river within the Western Geelong Growth Area
- Reform, deepen and revegetate the existing rocked swale drains to improve treatment of stormwater prior to discharge to the Moorabool River
- Investigate improvements to existing piped stormwater drainage and stormwater treatment to reduce discharge impacts on the Moorabool River.
- Install dog on-lead signs at key locations.

MANAGEMENT ZONE 2: CONSERVATION

This south-eastern section of the reserve is an integral part of the Moorabool River floodplain. Its indigenous overstorey vegetation structure remains largely intact with a series of small anabranches and billabongs that cut the area off from the broader reserve during times of flood creating a small island. The anabranch island and surrounds still have numerous large mature river red gums and patches of remnant riparian floodplain woodland vegetation and the lack of disturbance highlights the significance of this area to the Wadawurrung people.

The specific objectives for Management Zone 2: Conservation are to:

- Use shared Wadawurrung knowledge and practices to inform land and water management of this site to protect and restore its natural values
- Maintain floodplain hydrology and avoid intervention in natural erosion and deposition processes
- Provide for informal walking access, crossings and natural seating/viewing points overlooking the river
- Allow for dogs on-lead only to reduce impacts on native fauna and protect natural and cultural values.

The specific actions for Management Zone 2: Conservation are to:

- Prepare a site specific Healthy Country Plan to guide management and restoration in this zone
- Provide interpretive signage to illustrate the cultural significance of the reserve
- Revegetate areas subject to erosion to avoid the need for structural intervention in natural processes
- Liaise with Wadawurrung to establish final location and design of suitable crossing points where required
- Select fallen logs and confirm placement on site with the Wadawurrung to provide natural seating/viewing points overlooking the river
- Install signage to reinforce dog on-lead only to protect wildlife and cultural values in this zone.



Figure 8-2: Looking across the small anabranch of the Moorabool to the island within the area to be managed for conservation⁴⁹

⁴⁹ Photo: T. Wallis, RMCG, 2022.

MANAGEMENT ZONE 3: RESTORATION

This northern area of the reserve; which adjoins the historic 1863 Moorabool Railway Viaduct, has areas of exotic trees, planted pines and self-seeded elms, as well as a historically significant orchard of fruit trees including pear and apple trees. The area also contains some mature river red gums and patches of remnant riparian floodplain woodland vegetation together with another defined anabranch and series of smaller billabongs, which flow when the river is in flood and restrict access in several areas. The area is a stronghold for resident Swamp Wallabies.

The specific objectives for Management Zone 3: Restoration are to:

- Retain historically significant orchard plantings and contain the spread of exotic environmental weeds
- Provide for sensitive maintenance vehicle and informal walking access
- Provide natural seating/viewing points overlooking the river without formal infrastructure
- Interpret the historical values in the zone
- Prevent dog access to protect natural and cultural values, specifically for Swamp Wallabies and to avoid impacting the narrow habitat corridor.

The specific actions for Management Zone 3: Restoration are to:

- Undertake staged removal of Elms from the floodplain riparian zone while maintaining habitat corridor connectivity and refuge for Black Wallaby during transition
- Undertake fruit tree maintenance to improve tree health and replace lost trees with stock grafted from the remaining trees
- Maintain walking and maintenance vehicle access using only mown grass tracks
- Select fallen logs and confirm placement on site with the Wadawurrung to provide natural seating/viewing points overlooking the river
- Design and install interpretive signage for the historic Railway Viaduct
- Develop and install interpretive signage for the historic orchard plantings
- Install no dog signage at the entry point into this area of the reserve.

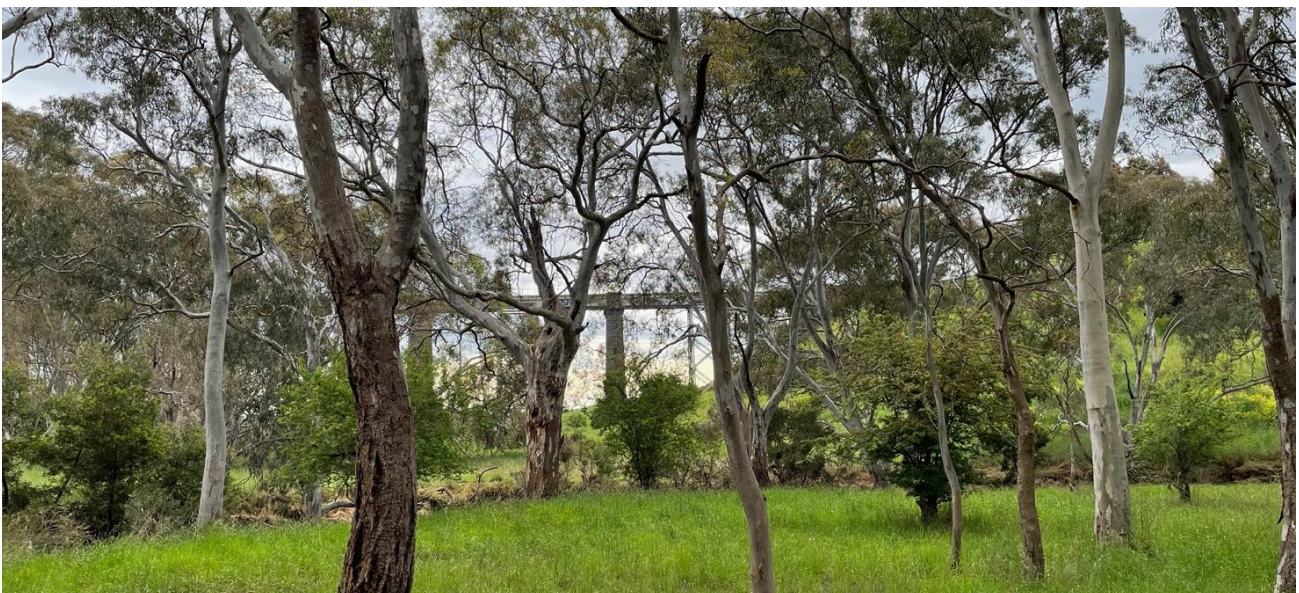


Figure 8-3: Looking north towards the Railway Viaduct showing an area of the reserve subject to staged restoration⁵⁰

⁵⁰ Photo: T. Wallis, RMCG, 2022.

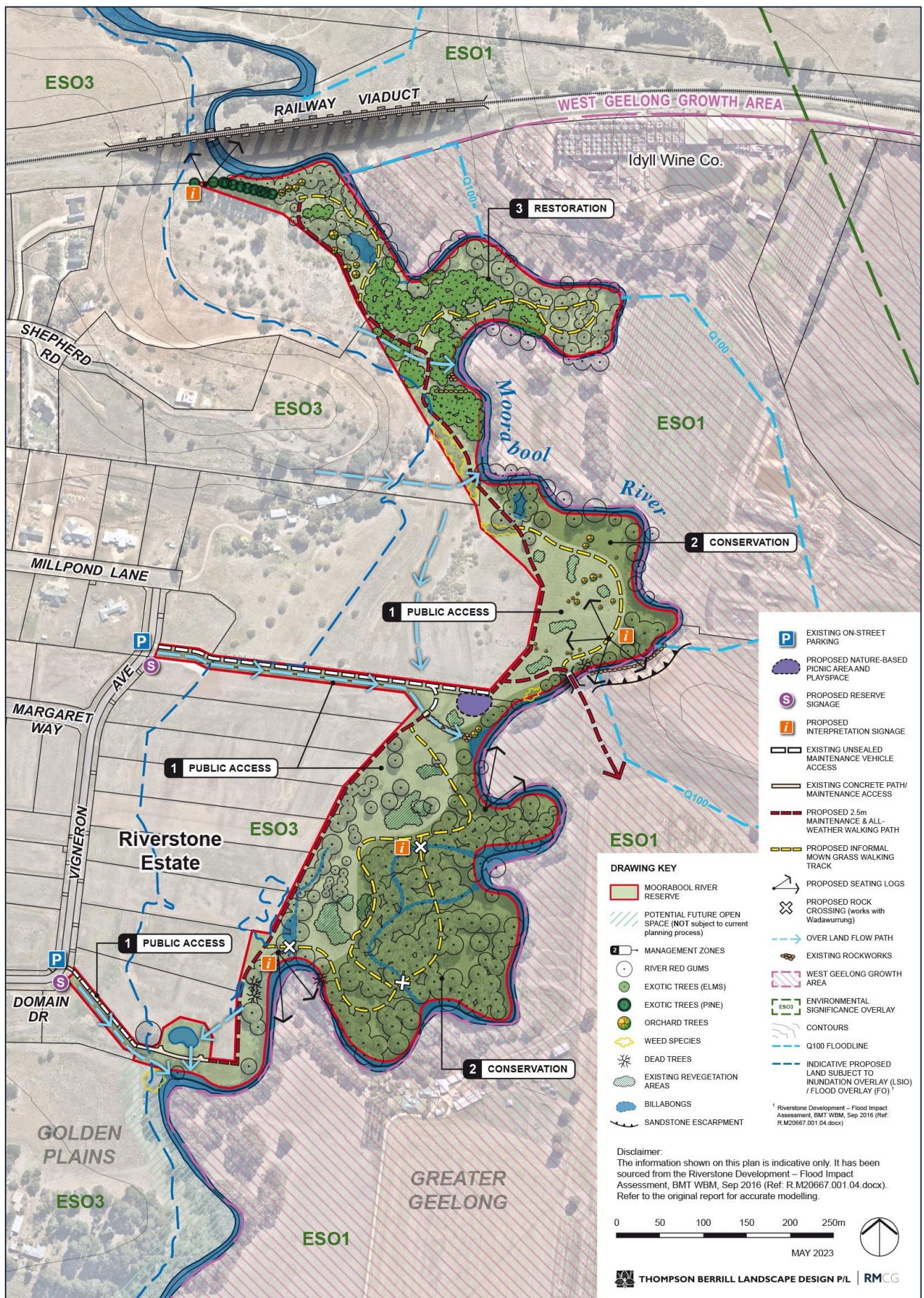


Figure 8-4: Moorabool River Reserve Masterplan

8.4 ACTION TABLES

OVERALL

NO.	ACTION	SUB-ACTIONS	PRIORITY
Objective: Improve awareness, understanding and appreciation of Wadawurrung values and culture			
A1	Adopt Wadawurrung naming for the reserve.	Liaise with Wadawurrung to confirm naming for the whole reserve or sections as appropriate. Design development for signs. Fabricate and install signs at each entry.	High
A2	Liaise with adjoining landholders to identify and protect cultural values and enhance habitat and natural values within the floodplain on private property.	Coordinate a field inspection of private property with Wadawurrung for interested adjoining landholders.	High
		Encourage use of indigenous planting buffers on private property within the natural river floodplain.	High
Objective: Improve walking and maintenance vehicle access.			
A3	Establish and maintain a program of regular mowing of mown tracks to facilitate visitor access		High/Ongoing
	See specific actions in Management Zones 1, 2 & 3		
Objective: Manage visitor impacts to minimise impacts on flora, fauna and other reserve visitors.			
	See specific actions in Management Zones 1,2 & 3		
Objective: Provide information/interpretation to improve visitor understanding and appreciation of the cultural, historic and natural values of the reserve.			
A4	Install interpretive signs (Cultural heritage, European heritage, natural values), at key points in the reserve.	Design development for interpretive signs in the three zones (Refer Zones 1, 2 and 3)	High
		Fabricate and install signs in each zone	High
Objective: Provide appropriate reserve zoning under the Golden Plains Shire planning scheme			
A5	Amend the Golden Plains Shire Planning Scheme to rezone the area to Public Park and Recreation Zone (PPRZ).	Prepare amendment documentation and undertake planning scheme amendment process.	High
Objective: Restore and improve biodiversity across the reserve through revegetation with local indigenous species.			
A6	Establish and maintain an annual program of revegetation of the reserve with local indigenous species to strengthen the habitat corridor	Annual indigenous revegetation program including site preparation and ongoing revegetation management to strengthen the habitat corridor along the riverbank and across the reserve	High/Ongoing
Objective: Provide climate resilient visitor infrastructure while minimising impacts on flora and fauna and the floodplain.			

NO.	ACTION	SUB-ACTIONS	PRIORITY
	See specific actions in Management Zone 1		
Objective: Manage declared weeds and established pest animals and environmental weeds to minimise impacts on flora, fauna and reserve visitors.			
A7	Maintain a program of annual control of declared weeds and established pest animals.	Pest plant control program.	Ongoing
		Pest animal control program.	Ongoing
A8	Establish and maintain an annual program of control of environmental weeds	Environmental weed control program	High
Objective: Minimise risk to reserve users.			
A9	Undertake regular arborist tree assessment to address tree risk.	Prepare scope for assessments in consultation with Council's Arborist to determine appropriate frequency for these to be undertaken.	High
		Undertake assessment and implement actions required to address risks identified	Ongoing
A10	Install flood warning signage and depth markers at both existing concrete overland flow path crossings		High
A11	Establish and maintain a program of regular slashing to maintain the reserve in a fuel reduced state.		High/Ongoing

MANAGEMENT ZONE 1: PUBLIC ACCESS

NO.	ACTION	SUB-ACTIONS	PRIORITY
Objective: Improve walking and maintenance access			
1.1	Improve access by extending the unsealed 2.5m wide path to provide a maintenance vehicle track and walking path between the two access points.	Install geofabric and establish a 2.5m wide crushed rock track in high wear areas.	High
		Install Class 4 RCP cut off drains to a geofabric base and build the path up over the top to maintain overland flows across the floodplain.	High
Objective: Provide passive recreation facilities including built visitor infrastructure that complements the natural character and can withstand periods of inundation and flooding			
1.2	Establish a small picnic and seating area with nature-based play space on higher ground adjoining the river.	Concept design and community engagement	High
		Cultural heritage management plan (CHMP)	High
		Install picnic shelter and tables	High
		Install nature based play area	High
1.3	Establish and maintain a mown grass around the picnic area and nature based play space area for informal passive recreation away from the river.	Maintain a mown grassed area all year round for informal recreation including picnics and play.	Ongoing
1.4	Select fallen logs and confirm placement on site with the Wadawurrung to provide natural seating/viewing points overlooking the river	Log seating to be installed on gravel base over geofabric,	High
Objective: Provide entry signs to identify, promote and encourage visitation to the reserve			
1.5	Design and install entry signs at the reserve entry points to identify, promote and encourage visitation to the reserve	Design entry signs that comply with Council corporate sign guide and install at both entry points	High
Objective: Improve stormwater management			
1.6	Reform, deepen and revegetation of the existing rocked swale drains to improve treatment of stormwater prior to discharge into the Moorabool River.	Excavate and slightly increase the depth of the channel at the start and end of the swale drains linking into the reserve to detain stormwater without altering the existing flow regime. Install imported weed free topsoil and larger rock to naturalise prior to planting. Revegetate infiltration areas with indigenous sedge and rush species into jute mat and maintain the remaining sections as mown grass.	Low
1.7	Investigate improvements to existing piped stormwater drainage and stormwater treatment to reduce discharge impacts on the Moorabool River.	Engage consultant to investigate and provide recommendations on improvements to piped stormwater drainage. Implement recommendations as funding allows.	Medium

NO.	ACTION	SUB-ACTIONS	PRIORITY
Objective: Allow for dog on-lead access only to reduce impacts on native fauna.			
1.8	Install dog on-lead signs at key locations.	Install dog on lead signs at each reserve entry	High
		Install dog poo bag dispenser and 240 litre rubbish bins at each entry.	Medium
Objective: Allow for future pedestrian bridge connection to Western Geelong Growth Area			
1.9	Confirm the location and alignment for future pedestrian bridge to be completed as part of the future open space on the east bank of the river within the Western Geelong Growth Area.	Confirm location and alignment as part of picnic area concept design including CHMP due diligence.	High
		Bridge design and construction to be completed as part of future Western Geelong Growth Area works.	Low

MANAGEMENT ZONE 2: CONSERVATION

NO.	ACTION	SUB-ACTIONS	PRIORITY
Objective: Use shared Wadawurrung knowledge and practices to inform land and water management of this site to protect and restore its natural values			
2.1	Prepare a site specific Healthy Country Plan to guide management and restoration in this zone		High
2.2	Provide interpretive signage to illustrate the cultural significance of the reserve		High
Objective: Maintain floodplain hydrology and avoid intervention in natural erosion and deposition processes			
2.3	Revegetate areas subject to erosion to avoid the need for structural intervention in natural processes	Focus revegetation works on vulnerable areas already subject to erosion but avoid any structural intervention to alter natural process or save trees from falling as these are part of the natural function of the floodplain.	Ongoing
Objective: Provide for informal walking access, crossings and natural seating/viewing points overlooking the river			
2.4	Liaise with Wadawurrung to establish final location and design for crossing points.	Construct the crossing points using geofabric to protect the natural ground, a pipe to maintain flow connection to the river and natural rocks collected from the Moorabool valley embedded in with indigenous floodplain planting.	High
2.5	Select fallen logs and confirm placement on site with the Wadawurrung to provide natural seating/viewing points overlooking the river	Log seating to be installed on gravel base over geofabric,	High
Objective: Allow for dogs on-lead only to reduce impacts on native fauna and protect natural and cultural values			
2.6	Install appropriate signage to reinforce dog on-lead only to protect wildlife and cultural values in this zone.		High

MANAGEMENT ZONE 3: RESTORATION

NO.	ACTION	SUB-ACTIONS	PRIORITY
Objective: Retain historically significant orchard plantings and contain the spread of exotic environmental weeds			
3.1	Undertake staged removal of Elms from the floodplain riparian zone while maintaining habitat corridor connectivity and refuge for Black Wallaby during transition	Remove outlier Elm infestations and revegetate with local indigenous species	Medium
		Remove core Elm infestations and revegetate with local indigenous species while retaining historically significant Elm trees	Low
3.2	Undertake fruit tree maintenance to improve tree health and replace lost trees with stock grafted from the remaining trees		Low
Objective: Provide for sensitive maintenance vehicle and informal walking access			
3.3	Maintain walking and maintenance vehicle access using only mown grass tracks		High
Objective: Provide natural seating/viewing points overlooking the river without formal infrastructure			
3.4	Select fallen logs and confirm placement on site with the Wadawurrung to provide natural seating/viewing points overlooking the river	Log seating to be installed on gravel base over geofabric	High
Objective: Interpret the historical values in the zone			
3.5	Develop and install interpretive signage for the historic Railway Viaduct.		High
3.6	Develop and install interpretive signage for the historic orchard plantings		High
Objective: Prevent dog access to protect natural and cultural values, specifically for Swamp Wallabies and to avoid impacting the narrow habitat corridor.			
3.7	Install no dog signage at the entry point into this area of the reserve.		High

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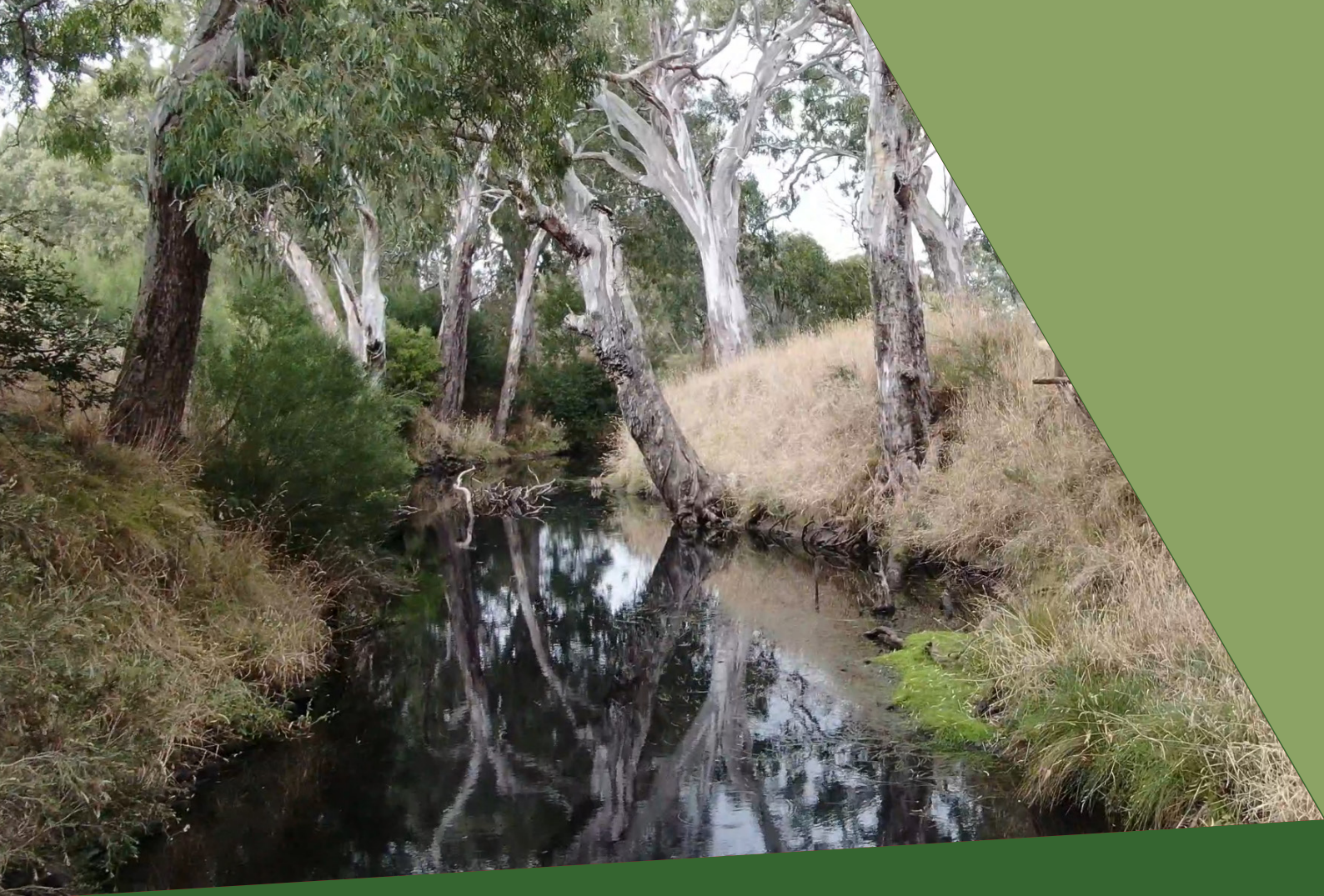
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